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THE
NATURALIST:

A
MONTHLY JOURNAL OF
Natural History for the North of England

EDITED BY

T. SHEPPARD, M.Sc., F.G.S., F.S.A.(Scot.), M.B.O.U.,

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RILEY FORTUNE, F.Z.S.

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A MONTHLY ILLUSTRATED JOURNAL
PRINCIPALLY FOR THE NORTH OF ENGLAND.

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The Museums Hull;

and T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
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Yorkshire Naturalists' Union.

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THE NATURALIST

FOR 1925.

NOTES AND COMMENTS.

EXIT 'THE IRISH NATURALIST.'

We are sorry to see the following announcement in *The Irish Naturalist* for November :—' With much regret we announce that with the end of the present year *The Irish Naturalist* will cease to appear. For thirty-three years this Journal, founded to promote the study of Natural Science in Ireland, has steadily fulfilled its purpose. In the earlier portion of its life it was able to pay its way, but with the great increase in the price of printing since the European War, and the loss by death or otherwise of many of its former supporters, it has been maintained at a steadily increasing annual deficit. This loss has been borne by the generous contributions of a body of guarantors, whose number, like that of our subscribers, has of recent years diminished, owing to the same causes. It is felt that it is no longer fair to these friends to maintain this burden upon them, and very reluctantly it has been decided to discontinue publication.'

FLOWERING IN THE NORTH OF ENGLAND.

In *The New Phytologist* issued on October 30th, R. H. McCrea writes on ' Flowering in the North of England in 1922 and 1923.' He gives ' a brief phænological study for the years 1922 and 1923 of the district of N.E. Derbyshire for the most part, but, in the late summer, of the neighbourhood of Whitby, Yorkshire. The original intention was to correlate the influence of various atmospheric factors with the time of flowering, the factors chosen being those emphasised by Warming for their ecological importance (*Ecology of Plants*, Eng. ed., Oxford, 1909), namely, temperature, sunshine, rain and wind. The analysis was attempted, but the results obtained were considered to be too indefinite and the data too bulky to justify publication, so that the course adopted by Sir F. Darwin has been followed ; that is, to publish the phænological lists along with the records of temperature, ' which is the principal condition affecting the rate of flowering.' This is strikingly illustrated by a comparison of the flowering and temperatures for the two years under consideration. Some very striking differences are noticeable ; the flowering for the early part of 1923 being much ahead of that for the same period of 1922, which corresponds very well with the higher mean temperature of the air for that period in 1923 ; and again the falling off later of the flowering for 1923 below that of 1922 and its subsequent recovery correspond to a similar drop and subsequent rise in the air temperature over

approximately the same periods. The comparison of the flowering was effected first by selecting those plants which occurred in the lists for both years, and then comparing the number which had already flowered at corresponding times in the two years. The mean temperatures per week are those supplied by the official observer at Worksop, Nottinghamshire, which was selected as the most representative observation centre available.'

A NEW MANX JOURNAL.

The Journal of the Manx Museum, a new publication issued quarterly at the Manx Museum, Douglas, at a shilling per annum, and edited by Mr. B. E. Sargeaunt, has been received. It consists of eight quarto pages in double columns, containing various items likely to interest the members of the Manx Society. There are notes on the Sawfly; Thirteenth Century Glass Painting; Bronze Sword; Roman Coins; Nelson Papers; The Lost Books of Livy; Roman Remains at Folkstone; Fitzwilliam Museum, Cambridge, etc. The publication will certainly give those interested in the Isle of Man Museum information as to what is being done in museums in other parts of the country, though personally we should have preferred a little more information as to the activities of the Isle of Man naturalists and archæologists.

MONEY SCALES AND WEIGHTS.*

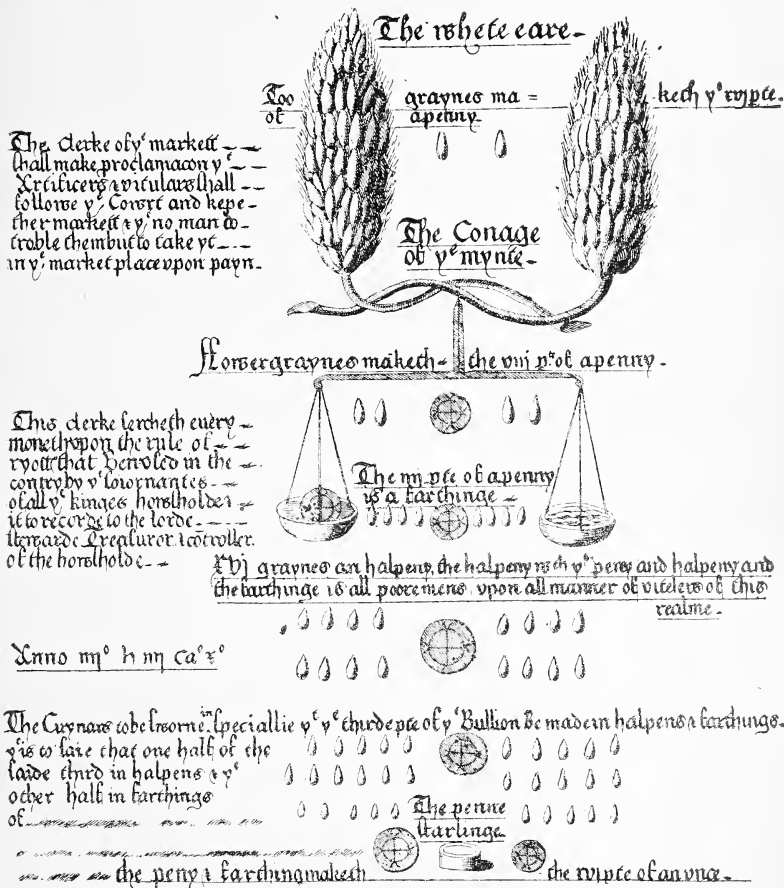
In this work considerably over two hundred sets of money scales and boxes, dating from Roman times to those of Queen Victoria, are illustrated and described, and, in addition, there is a chapter by Mr. J. F. Musham on 'English Coin Weights,' which contains a description of one of the finest collections of these in existence. The introductory chapter dealing with the general history of the necessity for weighing money in early and Middle Ages is based upon Mr. Sheppard's Presidential Address to the Conference of Delegates at the British Association a few years ago. The greater proportion of the specimens described in the book are on exhibition in the Municipal Museum at Hull.

AN EARLY EXAMPLE.

This work contains an interesting reference to an antique standard of weights and measures in the Exchequer in 1497, which gives curious information as to the origin of some of the weights. There are illustrations of various kinds of weights and measures, a view of the Exchequer, a Man in the Pillory for giving short weight, etc. From the centre of this document we learn that 'By the discrecion & ordinaunce of o^r soueraigne

* By T. Sheppard and J. F. Musham. London and Hull: Messrs. A. Brown & Sons, 221 pp., 10/6.

lorde y^e kinge and of his lordes spūall and tēpall wth y^e comons of y^e same his realms of England of all man^r of weight and measure y^t was made by y^e grayne of wheate. That is to understand y^t xxxij graynes of wheate taken out of y^e middell



of y^e yeare [ear] weieth [weigheth] a starlinge otherwise called a penny & xx starlinge maketh an ounce, etc. In the top left-hand corner of this remarkable document are illustrations of 'The White eare' with the information that 'Two graynes maketh y^e xvj pte [part] of a penny. The conage of y^e mynte [mint] flower graynes maketh the viij p^t of a penny. The iiij pte of a penny is a farthinge. xvj graynes an halpeny. the halpeny wth y^e peny and halpeny and the farthinge is all poore mens, upon all manner of vitelers of the realme

The cuynars [coiners] to be sworne in specialle y^t y^e thirde pte of y^e Bullion Be made in halpence & farthings y^t is to saie that one half of the saide third in halpens and y^e other half in farthings.' Accompanying this quaint information is a sketch of a pair of coin scales with a silver penny (on edge) in one tray, the other being full of grains, presumably thirty-two ! It is to be hoped that the eccentric fork to the scales is merely an error in the drawing !

NORTHERN NATURALISTS' UNION.

Based on the lines of the Yorkshire Naturalists' Union, the Northern Naturalists' Union has been formed, an account of which appears in *The Vasculum*, Vol. X., No. 4. Dr. F. C. Garrett is the Hon. Secretary *pro tem*. The first meeting of the Union was held at Hawthorn Dene in connection with the Northumberland and Durham Natural History Society, and included representatives of the Darlington Field Club, the Wallis Club, etc. At present the Union is utilising *The Vasculum* as the medium for publication of its records. We wish our northern friends every success.

DIVINING ROD.

In Volume 68 of the familiar *Manchester Memoirs*, recently published, is a well-illustrated paper on 'Mediæval Metallurgy,' by M. L. Becker. He informs us that :—'One of the principal subjects which has induced the "popular" scientist to investigate early books on mining is that relating to the mysterious use of the divining rod, or "twig" as it is sometimes called, when searching for underground water and metallic veins, etc. Where there is an element of magic one may be pretty certain to find a good deal of difference of opinion. This apparently applies to-day, but no doubt to a far less extent than formerly, and it is therefore of considerable interest to note that Agricola considered the use of the divining rod as nothing more nor less than superstitious waste of time. It is the scientific attitude taken up on questions of this nature which proves beyond doubt the accurate observation and broad-minded reasoning brought to bear throughout the whole work. When we consider that a century later than Agricola a man of such advanced mind as Robert Boyle (1626-1691), one of the founders of the Royal Society, was convinced of the genuineness of the divining rod, one is more impressed with the clarity of Agricola's vision. Even to-day while science has long since discarded it there are, we are told, many miners who believe implicitly in the effectiveness of this relic of superstition.'

—: o :—

'Lime-burning on a Yorkshire Farm,' by Dr. A. G. Ruston, appears in *The Journal of the Ministry of Agriculture* for November.

THE STUDY OF FLIES (DIPTERA).*

PERCY H. GRIMSHAW, F.R.S.E., F.E.S.

BEFORE entering upon the subject of this address, I should like to express to you my thanks for, and my keen appreciation of, the great honour which you, through your Executive, have conferred upon me by electing me your President for the year which is now drawing to a close. I can assure you that the letter of invitation which I received little more than a year ago gave me a somewhat severe shock, but after a little reflection it became a pleasant one, for I realised how proud I should be to fill a position which I had looked up to, as a youth, with a considerable amount of awe. But I felt that I had done little or nothing to merit such an honour, and I still feel that my principal claim to the position is that I am a Yorkshireman, born and brought up in the county, and that, although I have, through force of circumstances, spent the past thirty years and more in Scotland, yet I am still a true Yorkshireman at heart, and take the keenest interest in all that the Yorkshire Naturalists' Union has done, and is doing, to further our knowledge of the natural history of this great area.

I understand that it is customary for the Annual Address to deal with a subject to which your President has devoted particular attention. Now the branch of natural history in which I have been for many years specially interested was, up to a comparatively recent period, a sadly neglected one, and even now the serious students of the Two-winged Flies, or Diptera, are far too few in number. It will be one of my objects this evening, therefore, to show you that these apparently unattractive insects are in reality of the greatest interest, and that their study is not only full of fascination for the naturalist, but also of considerable importance from the point of view of the welfare of mankind.

I should like also to place before you my conception of what members and associates of the Yorkshire Naturalists' Union can and should do to further our knowledge of this neglected group of insects. When we reflect that there are considerably more than 3000 species of Diptera already recorded as British, and that probably at least 75 per cent. of these ought to be found in Yorkshire, it is not difficult to realise that there is plenty of work to be done, and that we need the co-operation of a large band of workers, many more indeed than the two or three—literally speaking—who are devoting themselves to the group, if our knowledge is to reach the level already attained in the allied orders Lepidoptera and Coleoptera.

* The Presidential Address to the Yorkshire Naturalists' Union, delivered at Sheffield on December 6th.

An experience of over thirty years among the extensive cabinets of British and Foreign Insects of all Orders in the Royal Scottish Museum, where the specimens are to be numbered by hundreds of thousands, enables me to assure you with some amount of confidence that the Two-winged Flies, in their structure, life-histories and habits, are not surpassed in interest by any other group. The great variety of the characters used in their classification, the wonderful details of their anatomy, external and internal, their diverse habits and remarkable life-histories, together offer an enormous and fascinating field for research, and there is much to do, for even in regard to many of our common British species little is known of their metamorphosis and their relationships to the world at large.

Why, then, are there so few Dipterists in our ranks? Probably the absence of text-books in the English language may account for this deficiency of workers, since students may find some difficulty in identifying the various species the occurrence of which in any particular locality has been noted, or the habits of which have been observed. One must perforce admit that this question of literature is a serious one, but the difficulty is not insurmountable, and I think with a little co-operation and organisation a great deal of useful work could be accomplished by our members. Now in the study of a particular group of animals or plants by the field-naturalist, one of the first things naturally aimed at is the preparation of a properly authenticated list of species occurring in the area investigated. Most of this work is accomplished by the private endeavours of individuals, who collect in, and compile lists for, their own particular districts. But they are encouraged greatly by the meetings of the Union, when they meet and exchange notes with their fellow-members. At these meetings also much useful supplementary collecting is done, and as the excursions are arranged on a definite plan, whereby every section of the county (*i.e.*, each vice-county) receives a proper share of attention every collecting season, much useful information is acquired, directly by the Union, and placed on record. In many groups we are now in possession of fairly complete lists of the species which inhabit the county. Previous to the year 1907 the records of Flies found in Yorkshire were few and scattered, and our knowledge of this section of the fauna was practically *nil*. In that year, however, the publication of the Victoria County History offered an opportunity for the preparation of what might be called a preliminary list, based on previously published records, and on the material either in the compiler's own collection or submitted to him for identification. The result was an enumeration of some 368 species known to occur in the county up to that

date. The issue of this work evidently acted as a great stimulus to the study of Diptera, as it undoubtedly did in other departments, for we find that in about a dozen years Messrs. Cheetham and Ashworth were able to give the number of Yorkshire species as about 758—more than double what it was in 1907. Another indication that an increased interest was being taken in these insects lay in the fact that in 1906 a special Committee of the Union was appointed to deal with Hymenoptera, Diptera and Hemiptera, and a year later a referee was appointed for the group we are now considering.

During the past year I have endeavoured to compile a list of published records up to date, and can now state that we possess satisfactory evidence of the occurrence of at least 1400 species in the county. If we add to these records which are actually published a considerable number which are in the note-books of our workers, awaiting publication, I think that we can safely say that in the short space of four or five years the county list has again been practically doubled. Now this appears to me, from the point of view of preliminary work, *i.e.*, the compiling of a bare county list, to be eminently satisfactory. Our census compares favourably with those of other counties, as shown by the following figures, very kindly furnished to me by Professor J. W. Carr, of University College, Nottingham. He informs me that since the publication of his valuable '*Invertebrate Fauna of Nottinghamshire*,' in which 921 species were recorded, the number has since been raised to 1530. He also states that for Hereford under 1500 species are known, for Norfolk 1055, and for Suffolk, the county of our authorities Verrall and Collin, the number is roughly 1620.

We are still, therefore, somewhat behind our neighbours in Nottingham, and we should not rest satisfied with this, for we have an area fully seven times as large as theirs, with extremely varied physical conditions, such as mountains, moors and marshes, to say nothing of the many miles of coastline, where many species occur which are not found inland. We must apply ourselves with still more vigour to the thorough working-out of our Dipterous fauna, and in friendly rivalry bring up our list to at least the Nottinghamshire level. But to do this, and more, we require more workers. I wish we could convince some of our younger members and friends of the great interest and fascination attached to the study of these poor neglected flies. They are to be found everywhere, in our homes, in our streets and in the heart of our cities; our town and suburban gardens and our country lanes swarm with them; our woods and plantations are full of interesting forms; our meadows, marshes and moorlands all have their peculiar species, while our hills and

mountains up to their very summits, and our shores down to the tide-mark itself, furnish the collector with abundant and most interesting material for study. Flies are extraordinarily easy to collect, the necessary apparatus is of the simplest and most inexpensive nature, while the work of preparing them for the permanent collection is far less laborious than is the case in most other insects.

The only difficulty, as I have already remarked, is in connection with the identification of specimens, but I believe the greater part of this trouble might be overcome by the adoption of some such method as the following. It is well nigh hopeless for any single worker in any part of Britain to attempt to name the flies of all families, and hence it is necessary to specialise. If each collector, while actually amassing material in every group, were to pay special attention to one particular family he might readily and at comparatively small expense be able to acquire the necessary literature (British, French, German or otherwise), and soon become sufficiently expert to name with tolerable certainty not only his own specimens, but also those of his colleagues. They, on the other hand, specialising in like manner, but upon different groups, would be just as able and willing to help in return, and thus by a kind of scientific labour exchange each Dipterist would get together a collection fully representative of his own district, and would be able to add much of value to our knowledge of the fauna of the county in general. Co-operation of this kind would also, at a minimum of trouble and expense, give each person interested in the subject, not only a special knowledge of his own particular group, but a good general acquaintance with flies as a whole, sufficient, moreover, to enable him to investigate many of the interesting problems of which I shall speak later.

Now the mere compiling of a county list is useful, so far as it goes, but after all it is only a preliminary step, and for scientific purposes a bare list of species is not of great value. It is obvious, too, that work of this kind must, sooner or later, come to an end, for the discovery of additional species becomes more and more difficult and unlikely in direct proportion to the size of our list. Hence we find ourselves at last in a *cul de sac*, and we must strike out on other lines. Let me point out how further collecting may be of value. I do not believe that *any* species, however abundant it may appear to be, occurs in every part of the county. Even the distribution of such species as the House-fly (*Musca domestica*), the Common Dung-fly (*Scatophaga stercoraria*), or the apparently ubiquitous Winter Midge (*Trichocera hiemalis*) must show gaps somewhere. Where are these gaps, and why are they there? Is it a question of food-supply for the larvæ, of

adverse physical conditions, or to what is their absence due? In other species, those that we call rare or less abundant forms, the gaps are of larger extent, while in some cases the areas inhabited by the species may be few and far between. Information on these lines can only be obtained and accumulated by an *intensive* method of collecting, and the energies of our field workers could be well devoted to exhaustive researches in this direction. The details of this kind of work could either be plotted on maps of a suitable scale, or recorded by a system of card-indexing. I am quite sure that careful and thorough investigation on these lines would be well worth while, and would probably lead to some interesting discoveries. And it is exactly the kind of work that lends itself to an association like ours.

In support of these ideas I should like to refer to a very interesting paper by C. G. Lamb, which appeared in the 'Proceedings of the Cambridge Philosophical Society' about three years ago. It is entitled 'Insect Oases,' and refers to a series of detailed observations bearing upon the Diptera inhabiting a certain sandy waste of fair extent in the north of Cornwall. By visiting this area at the same period of the year for many years in succession the author discovered that 'In this perfectly homogeneous area, and in places which careful investigation shows to be in no way different from the surroundings, certain species of Diptera appear to inhabit quite definite oases or islands. One may proceed to such a spot at the proper season with the certainty that the insect will be found, and that in fair or even great numbers, while the rest of the area may yield one or two specimens at most, and that with extreme rarity.' Five species are referred to in detail, and it is significant that four of them are of southern distribution. After long and careful investigation the author was unable to discover any circumstances whatever that could be correlated with this peculiar distribution. He accordingly concludes that these cases are examples of approaching extinction. To quote his closing words, 'The most probable reason for the extremely restricted distribution of these insects is that we are in the presence of the last stage of the extinction of a species. With creatures of such comparatively sedentary dispositions, once an island is formed it has little chance of increase. There must be a minimum population density which is such that when the density approaches that minimum the chance of reproduction is practically zero; as there is no evidence that any of the species have sex-attracting powers, this minimum density might well be attained at a comparatively small distance from the centre of the colony.'

I have referred to this paper in some detail as I consider it of exceptional interest, and whether we agree with the con-

clusions or not, it will show you that certain interesting results may arise from a careful and thorough investigation of a small area. It is possible that a little experience of my own may be explained in a similar way. A few years ago, while collecting along a road which ran past a certain small loch in the Scottish Highlands, I discovered a species of midge (*Tanytarsus tenuis* Wulp.) which was not only new to Britain, but which had never, so far as I could ascertain, been taken since it was originally found in an obscure locality in Holland. Since I only took about half-a-dozen specimens and wished for more, I returned the following summer and obtained a good supply, but I noticed that they only occurred in a very restricted area, limited to a few square yards, and as far as I could remember, exactly where I found them the previous year. Possibly, then, this is another case of a disappearing species, although, of course, there may be some other explanation. The fact that the same species has since been taken in two localities in the island of Arran may militate against the theory. Being a very tiny fly, it may easily have been overlooked by collectors.

Akin to this subject is another question requiring investigation, and that is the range of flight of individual flies. In one or two cases, such as the House-fly and the Tsetse flies, experiments have been carried out for the elucidation of this point, but we know nothing of the flight of the individual in the vast number of other species. Here is a profitable field for work, and one that would present little difficulty were some satisfactory method of marking the specimens to be devised. The subject has an important bearing upon the distribution of species, and although at first sight it would seem that flies travel over a great distance, yet I believe that when exact information is forthcoming it will be found that the flight of an individual is fairly restricted, possibly at most a mile or two, and often much less, and that the wide distribution of many species has been accomplished by a slower and more deliberate extension of area. But it is no use guessing the answer to a riddle of this kind ; what we require is exact observation.

Several methods of marking flies for observation have been tried with more or less success. In one series of experiments small spots of white or gold enamel were applied to the wing or thorax of House-flies, but the results were not very satisfactory. Finely ground blackboard chalk of various colours have been also tried with the same species. The flies always attempted to clean themselves, but were never able to get rid of the chalk which adhered to the base of the wings or the upper portion of the thorax. Other substances used were certain aniline dyes made up into powder and mixed with

rice starch or alcohol, in the latter case being applied in the form of a spray. All these operations seemed to disturb the flies and render their behaviour abnormal, and in some cases the use of dyes caused a large percentage of mortality. Perhaps the most satisfactory method yet devised is one adopted by Dr. J. J. Simpson in his experiments with Tsetse flies. He cut off the two terminal joints of various feet, which operation is not so painful as it seems, causing, I should imagine, little inconvenience to the fly. We all know how readily a Daddy Longlegs (*Tipula*) will part with one or more whole legs and apparently suffer no hardship ! Owing to the nature of the nervous system insects feel little, if any, pain, and the experimenter need have no qualms of conscience in depriving a fly of one or two of its tarsal joints. But in any case, some other satisfactory method of marking might soon be discovered by experiment, and thereafter the investigation would be tolerably straightforward. Before leaving this part of my subject, I may remark that in the case of House-flies the marked specimens were usually recaptured within a few hundred yards of the place of liberation, and in those cases where the distance travelled exceeded a mile it was suggested that they were carried by the wind. Hewitt indeed makes the definite statement that normally they do not fly great distances. The experiments with Tsetse flies were made with a view to ascertaining whether specimens liberated at various distances from a certain river would return to it. Out of 3000 examples used in the experiments it was found, among other results, that '(1) the greatest distance covered by a single tsetse was four miles ; (2) apart from this, none returned over two miles ; (3) all seemed to return to the water, as none were caught at a greater distance from the river than where they were liberated.'

We are fortunate in having within the limits of our county, especially in the north-west, a considerable extent of hilly country, with some grand mountain masses rising to an elevation of considerably over two thousand feet. Here we have an opportunity for carrying out a series of observations on entirely new lines. I know of no systematic records of the *altitudinal range* of flies, that is to say, we know practically nothing definite regarding the height above sea-level to which these insects ascend. Little collecting has been done on the higher hill-slopes, and although we know in general that certain Tabanidæ, Empidæ, Tipulidæ, Anthomyiidæ, Lepidæ, and so on, occur at considerable elevations, yet we are entirely without exact figures and observations on this interesting point. It is perhaps a reasonably fair assumption that the Dung-fly, *Scatophaga stercoraria*, may be found from sea-level up to our highest mountain summits, but since, on the

other hand, the number of *species* of flies inhabiting such a summit is *extremely limited*, the most primitive reasoning shows us that for the majority of species there is an altitude limit below this summit. Yet in not a single case have we any definite figures!

Turning now to another geographical feature of the county, we have in Yorkshire a long and varied coast-line, and it is well known that certain flies are confined to the shore region, some being even limited to the area between tide-marks, their larvæ feeding upon the animal and vegetable refuse of the beach. Others again are lovers of the sand-dunes, and so on. As examples of these beach-dwellers, I may mention the mosquito, *Ochlerotatus detritus*, whose larva is only found in brackish water, the midge *Clunio marinus*, likewise with a marine larva, *Machaerium maritimæ* (one of the Dolichopodidæ), the handsome Syrphid *Eristalis æneus*, the Anthomyiid *Mydæa protuberans*, and the peculiar *Actora æstuum*, whose larva is reputed to feed on thrown-up seaweed, and is covered every tide. In the case of these and many other species of Diptera found near the sea it would be interesting to ascertain in each case exactly how far inland the fly occurs, either by flight or as a breeding species, or whether it is strictly confined to a certain distance from the shore.

I have thus far made a few suggestions for work in the way of extending our knowledge of the details of the geographical distribution of species, and these suggestions I trust will appeal to those of our members who are attracted mainly by work in the field, and who are prepared to collect specimens on an extensive scale. But for out-door workers there is another important class of investigations, necessitating not only the most careful and elaborate collecting, but also a considerable amount of patient and detailed observation, coupled with careful and accurate deduction. These investigations may be grouped under the general heading of *ecology*, and may be defined for our special purpose as the study of flies in relation to their environment. But the environment of any organism or group of organisms is so complex that its investigation involves the co-operation of workers in practically every department of natural science, and it would be impossible within the limits of this address to deal with such a comprehensive subject in all its aspects. I shall therefore restrict myself to the consideration of a few lines of research which, in my opinion, could be followed with advantage by the amateur Dipterist.

The study of insect communities offers a fine opportunity for entomologists of all kinds to work together. Some well-defined area, such as a piece of marshy ground, a patch of woodland, a rich meadow, or, perhaps, an upland pasture,

should be chosen, and a list as complete as possible made of the species occurring in it. This preliminary step accomplished we have next to ascertain which species are truly native to the area, and which are invaders, either temporary or permanent. Now, as Dr. A. E. Cameron has well said, the 'real index of an insect's habitat is where it breeds,' and hence it follows that we must find out the larval habits of every species met with, and especially whether they occur during their early stages within the area under review. In the case of larvæ living in the soil, it is not a difficult matter to collect them and rear them to maturity, and much useful work can be done by the amateur on these lines. In this connection there is plenty of opportunity for making interesting discoveries, for comparatively little is yet known concerning the early stages of a large number of common British flies whose larvæ presumably inhabit the soil. Assuming that all the requisite information on this particular branch of the subject has been acquired, it will then be possible to make up a complete list of endemic species. The next task is to ascertain by estimate or actual count the comparative abundance or scarcity of each species. It will probably be found that the Diptera are, as a rule, fairly numerous in individuals, and it would form a point of considerable interest to know how they compare numerically with the insects of other orders which inhabit the same area. We should then be in possession of an accurate census of the constituents forming a true Insect Association or Community. This kind of work, if carefully and thoroughly carried out, would form an excellent groundwork for further research, and since the number of areas suitable for investigation is enormous, the opportunities for such are practically unlimited.

The services of the botanist must be requisitioned, to furnish a complete and detailed list of the flora of the area under review, in order to ascertain what relationships exist between the Diptera and the plants with which they are in any way associated. A consideration of the habits of the various larvæ, be they root-feeders, leaf-miners, gall-makers, or otherwise, would reveal the dependence of certain species upon the presence of a particular food-plant or host-plant, and so on. Likewise, the geologist, chemist and physicist would be called upon to prepare an account of the various soils and formations tenanted by dipterous grubs—their texture, chemical composition, water-content, temperature and other details. The joint labours of entomologist, botanist, geologist and other workers, if bestowed as I have indicated upon a series of well-selected areas in the county, would form an important contribution to our knowledge of the conditions which influence the life of flies in general, and would throw a

flood of light upon the question of the distribution of species. This is an enormous subject, however, and I am only suggesting in very general terms such preliminary work as I consider might well be undertaken by our members.

We may next include in our study of flies certain points of interest in connection with their habits, and concerning which we still require much observation. A certain popular song asks pertinently—I had almost said impertinently—‘where do the flies go in the winter-time?’ Now, from a scientific point of view this question is of some importance, especially where species of economic interest are concerned, and the answer to it is not so simple as one might think. Even in the case of the Common House-fly (*Musca domestica*) the problem is as yet unsolved. At one time it was taken for granted that the survival of this species from year to year was secured by the hatching of eggs which had been laid by females which had hibernated, this supposition being founded upon the observation that a limited number of individuals take shelter in the late autumn in warm places, and spend the winter in a torpid condition in crevices, behind loose patches of wall-paper, behind pictures and curtains and so on. As we shall see directly, there is good reason to suppose that this idea arose from mistakes in identification, for when the subject was recently taken up by expert dipterists, no actual evidence could be obtained in support of the theory. In warmer climates the House-fly unquestionably continues to breed all through the winter, but in the British Islands, the majority of individuals die off in late autumn, and only a few survive inside houses, restaurants and other heated buildings, and it has not yet been proved that these actually survive until the following breeding-season. Nor has it been satisfactorily shown that this species passes the cold season in the larval or pupal stage, although there is some little evidence that such is the case. The most recent discovery in this connection is one announced by a French naturalist, who claims to have found, near Paris, the grubs of House-flies in living snails in winter. This report, however, requires confirmation before it can be accepted without question. We have here, then, a promising subject for investigation, and seeing that the House-fly is a notorious disseminating agent of many serious diseases, it is one of the utmost economic importance.

With regard to certain other species which occur in houses, and which are likely to be mistaken for the House-fly except by the trained Dipterist, there is fairly satisfactory proof that hibernation in the adult condition is a fairly general phenomenon. Several cases have been reported, some of which have come under my own personal observation, of immense numbers of flies having been noticed in houses during the late

autumn and winter months on the ledges and frames of windows, on the floors in the vicinity of windows, or on the neighbouring walls. In certain cases, moreover, this phenomenon has been noted for many years in succession. These flies were in a lethargic condition, and large numbers were swept up and submitted to me for inspection. I carefully examined and identified every specimen, and the result may be worth summarising in this place. It should be noted that out of several thousands of examples only one Common House-fly was found. Excluding this species, and a few others which were represented by fewer than half-a-dozen specimens, it was discovered that only three species were present in sufficient numbers to justify the assumption that they hibernate in houses. The first of these is a small member of the family Anthomyiidae, known as *Limnophora humilis*. Of this, the principal species concerned, over 900 specimens were actually counted, and others merely estimated to run to several hundreds. It is remarkable that in the heaps of flies of this kind swept up, not a single male was present, and it was equally interesting to find that ten of the females picked out at random by Dr. (now Professor) J. H. Ashworth, of Edinburgh University, and dissected by him, were found to be, without exception, fertilised. It appears, then, highly probable that we have in this case a true instance of hibernation, and we should expect these females to issue forth in the following spring and lay their eggs, thus initiating the new generation. The second species, a larger fly bearing the name of *Dasyphora cyanella* (= *Pyrellia eriophthalma*), and belonging to the family Muscidae, was represented by 332 females and 264 males, while of the third species, also a member of the Muscidae, and called *Pollenia rudis*, some 425 females and 225 males were identified. Here the presence of males introduces a new factor into the problem, and emphasises the necessity for further observation on this interesting question.

In connection with the habits of adult flies, many other subjects present themselves for investigation. Certain phenomena associated with their flight are well worthy of attention, and an extensive series of observations bearing upon these phenomena would be of much interest. For example, it is well known, even to the novice, that certain Diptera, e.g., Midges (Chironomidae), the Winter-Gnat (*Trichocera*), and others, habitually associate in large swarms, consisting of hundreds or even thousands of individuals. These swarms, at least in the case of Midges, are mainly composed of males, but females are often present, and the actual number of each sex in a swarm has only been ascertained in a few cases. Additional information, therefore, on this point would be valuable. Then again, the influence of the weather upon these

swarms, including the effects of wind, the direction of the same, and the degree of cold, the time of day and the time of year when the swarms are prevalent, although known in one or two cases in a general way, yet should be worked out in full detail and carefully tabulated and studied. In certain families, notably in the Empidæ, a series of remarkable phenomena, involving some knotty physiological problems, have been observed in connection with the courtship flights of these insects, but this is a subject upon which I cannot enter in this place. The case of the genus *Empis* has been fairly well investigated by Milburn Howlett and A. H. Hamm, and I would recommend those who are desirous of following up these interesting observations to consult the memoirs published by these authors in 'The Entomologist's Monthly Magazine' for 1907, 1908 and 1909.

In the ordinary every-day collecting of specimens for the cabinet, much can be done to extend our knowledge of the habits of flies. Precise dates are important, especially those at the beginning and end of the season, and if observations are made and notes taken of the relative abundance or otherwise of the various species, the proportionate number of the sexes, the kind of weather, time of day, and so on, much interest will be added to the capture of specimens. In the case of flies taken on flowers, although a good deal has been already done in the way of noting the object of their visits, such as the sucking of nectar, feeding on pollen, or merely for resting purposes, yet there is still plenty of scope for observation, especially when a study is concurrently made of the mouth-parts of the various species and of their adaptation to a floral diet.

Variation in Diptera is another subject that would well repay attention. For example, among Crane-flies *Limnophila nemoralis* occurs in several well-marked forms, while in Syrphidæ such genera as *Volucella*, *Eristalis*, *Criorrhina* and *Merodon* include hairy species which are liable to vary in colour. The numerous species of *Syrphus*, too, are worthy of careful study from the point of view of possible variation. The very abundant Dung-fly, *Scatophaga stercoraria*, may be taken in any month of the year, and varies considerably in colour. Is the intensity of colouring associated with any particular season, and is the form named *merdaria*, a distinct species, a colour variety, or merely the ordinary form of female—as I am myself inclined to believe? The brilliant metallic flies of the genera *Lucilia*, *Pseudopyrellia* and *Pyrellia* vary considerably in tint and offer an encouraging field for investigation. And, again, in the important and fascinating study of chaetotaxy, or arrangement of bristles, now much used in differentiating species, genera and even families of

Diptera, especially in the groups related to the House-fly (*e.g.*, Tachinidæ, Muscidæ and Anthomyiidæ) and in the various families of Acalyptrates, there is still much to be done in determining the limits of variation.

Again, there remains an immense amount of work to be accomplished in relation to the feeding habits and life histories of Diptera. Take as an example those delicate little flies the Fungus-gnats (Mycetophilidæ), of which we have hundreds of species in Britain, and at least a hundred in Yorkshire. It is well known, and is implied in both the popular and the scientific name of the family, that the larvæ of most of these flies live in fungi. But apart from the general fact, little has been recorded regarding the actual species of fungi infested. Is there any discrimination shown by the Fungus-gnats in the laying of their eggs and the selection of food for their grubs? In other words, is there any interrelation between a particular species or group of species of Mycetophilid gnat and a particular species or genus of fungus? In the case of their near relatives the Gall-midges (Cecidomyiidæ) there is a very decided relationship between the fly and its host, so much so, in fact, that the specific name of the insect is in the great majority of cases founded upon the generic or even specific name of the plant it infests. It is just possible, therefore, that some relationship of the same kind, though not perhaps so marked, may exist in the case of the Fungus-gnats. A similar question may be raised in the case of the tiny Agromyzidæ and Phytomyzidæ, the larvæ of which are leaf-miners. It is only by patient and long-continued observation, accompanied by the actual rearing of specimens, that such problems as the above can be solved, but I would earnestly recommend the student of Diptera to take up work of this kind in addition to his ordinary collecting.

The study of Flies in relation to other insects would, from the nature of the case, include some interesting observations upon the habits of the predaceous groups Asilidæ, Empidæ and Dolichopodidæ, and of the parasitic family Tachinidæ. In the first three groups the mature fly preys upon other insects, but we have very little information regarding the specific nature of the prey, and detailed lists giving the name of the fly and its victims in each case would be of much interest. The larvæ of the Tachinidæ, on the other hand, are parasitic within the bodies of caterpillars, and although the hosts of many species have been recorded, much yet remains to be done before we can regard our knowledge as satisfactory.

Lastly, there is the great and important subject of Flies in their relation to the human race. Anything like a satisfactory treatment of this topic would involve not a single discourse, but a whole course of lectures. I am compelled,

therefore, to limit my remarks to a very concise review of the subject, only sufficient, indeed, to show you how important the study of these insects really is. Apart from the fact that certain flies act as scavengers, we may take it that the balance of evidence shows that Diptera as a whole are more or less inimical to man's welfare. Their adverse influences and activities may be grouped under three distinct headings. In the first place, many species are injurious to our food-plants, attacking our cultivated crops of vegetables, fruit and cereals ; secondly, several species attack our domestic animals, thus damaging our supplies of meat, wool, hides and so on ; thirdly, not a few forms attack man more directly, by introducing certain disease-producing organisms into his blood, or by contaminating his food with others equally dangerous. In order to fight these insidious pests successfully it is essential to learn as much as possible concerning their habits and life-histories. We must discover their vulnerable points so as to be able to apply our knowledge to the best advantage. In nearly every civilized country of the globe there are now at work bands of enthusiastic students, either working privately or attached to some College or Board of Agriculture, who spend their whole time investigating the problems concerned with the control of Diptera. Moreover, a knowledge of certain Flies, especially the blood-sucking and plant-infesting species, is included in the medical and agricultural curricula of every University. It is thus evident that we are now fully alive to the importance of this subject in its bearing upon the health and wealth of the race. And yet, less than a generation ago there was hardly a more neglected subject in the whole domain of zoological science than the study of Flies. The great success which has already been achieved in all directions by the application of practical measures rendered possible only by the most patient scientific research forms one of the most romantic chapters in the whole history of mankind. The new light which has been thrown on the nature of such diseases as malaria, yellow fever, sleeping sickness, and many others, has enabled us to devise prophylactic measures which have proved extraordinarily successful. And what I wish to emphasise is this : in all these cases the medical man owes his success primarily and essentially to the researches which were made, either by himself or in conjunction with others, upon the natural history of certain flies ! The same remark applies to our farmers, whose crops of every kind have benefited from the scientific study made of the injurious flies of the homestead, and to the stock breeder, whose herds and flocks are now skilfully and successfully treated when attacked or infested by Bot-flies, Gad-flies, or other Diptera.

Before concluding I should like to mention just one ex-

ample of the interesting problems which may arise at any time in connection with injurious Diptera and their habits. There is a certain little fly, belonging to the family Ephydridæ, which bears the name of *Hydrellia griseola*. It is very abundant over the whole of Britain, and belongs to a genus containing about thirty species, which are all leaf-miners while in the larval stage. Curiously enough, while all the other species of the genus, so far as known, mine the leaves of aquatic plants, such as Duckweed, Water Plantain, Frog-bit, and so on, *Hydrellia griseola* attacks wild grasses of many kinds and cereals! Although so common in Britain it is so far of no economic importance in this country. On the other hand, in certain parts of the continent, notably in the regions surrounding the Baltic Sea, it has been known for nearly sixty years as a serious pest of barley and oats, attacking, as well, many kinds of meadow-grass. Last year, in the neighbourhood of Riga and the eastern Baltic, more than half of the barley and oat crops was threatened with destruction, many entire fields being ruined by the maggots. Now, why should the Baltic region be thus devastated while Britain is immune? The importance of a knowledge of the life-history of this fly is obvious, so that we may be prepared at any time to cope with its attack should it extend its feeding habits to our cereals. Its maggot is very similar in appearance to that of the Gout Fly (*Chlorops tæniopus*), already too well known as a barley pest in this country, and it is necessary, therefore, to be able to distinguish one from the other by precise characters and without question. We are here, then, face to face with an interesting example where accurate knowledge, though apparently of little importance at the moment, may in the near future be of the utmost service in coping with a new pest.

It may be questioned whether these remarks really concern the members of an Association like ours. In reply I would remind you that there are still many problems to be cleared up in connection with the flies of economic interest, and some of these are quite within the scope of the amateur. And, as we have just seen, we hardly know as yet what particular flies are or are not of importance to ourselves in one way or another. It is quite within the bounds of possibility that several species at present regarded as innocuous may at some future day be proved to be either directly or indirectly concerned with our well-being or the reverse. Even now there are certain flies which, although not absolutely proved to act as carriers of disease, are nevertheless looked upon with grave suspicion, and only continued research will enable us to place them on the black list, or acquit them altogether, as the case may be. Let us therefore continue to study flies in any such way as is provided for us by opportunity, for every

single fact gained is a step forward. The accumulation of facts first, and theories afterwards, is the surest and safest way to build up the great temple of knowledge which we call Science.

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Grey Hen in Yorkshire.—Sir T. Willans Nussey writes to me that on the 14th November, while shooting near East Tanfield, in the North Riding, a Grey-hen was flushed. The bird was seen by several persons, who had no doubt as to its identity.—W. H. ST. QUINTIN.

Red Squirrel in S.W. Yorks.—This mammal appears to be extending its range in the Huddersfield district. I saw one in West Wood, Honley, on the 4th August last, and it has been seen on several occasions since up to the 12th October and reported to me.—W. E. L. WATTAM, Newsome, Huddersfield.

Some Northern Orthoptera.—A specimen of *Leptophyes punctatissima* Bosc. has occurred to me on the Wolds near Middleton. This is a new County record, but not the most northerly locality, as the species has been recorded by Gordon from Wigtonshire (Lucas, 'British Orthoptera,' p. 198). A second Yorkshire specimen (♀) of *Pholidoptera griseo-aptera* De Geer, jumped on to the waterproof sheet while I was sifting moss for beetles at Hayburn Wyke on September 17th. This is a new record for V.C. 62, and the most northern record. The house-cricket, *Gryllus domesticus* Linn., seems to be by no means a common insect in N.E. Yorks., but I used to hear the species 'chirping' in the ash-pit of a hot-house opposite my house in Middlesbrough. The species was abundant this year in a bakery at Ambleside (Westmorland), where it was running over the hot ovens, and hiding by dozens under greasy sacking near the fires.—GEO. B. WALSH, Scarborough.

Hybernia defoliaria abundant near Huddersfield.—*Hybernia defoliaria* has been markedly abundant in the neighbourhood where I reside during the latter part of October and onwards. Every morning, when rain had fallen heavily the previous night, the road and pathway immediately surrounding the lamp-posts were strewn with dead moths. Not that the evidence of their abundance depends entirely upon this array of corpses. Numbers of living specimens were detected at rest during the day, or on the wing in evenings when rain was less heavy. Only to-night (November 5th), when returning home at 10 p.m., up Dog Kennel Bank, I counted fifteen specimens perched on the iron framework supporting the head of one lamp alone, and other lamps harboured similar numbers, and there were several on the wing. The moths seem to avoid the direct glare of the light, preferring shadier positions.—CHARLES MOSLEY, Huddersfield.

THE YORKSHIRE NATURALISTS' UNION'S SIXTY-THIRD ANNUAL REPORT

FOR 1924.

(Presented at Sheffield, December 6th, 1924).

The Sixty-second Annual Meeting was held at Barnsley on December 8th, 1923, and a report of this meeting is given in *The Naturalist*, beginning in January, 1924. The Presidential Address was delivered by Sir Arthur Smith Woodward, LL.D., F.R.S., his subject being 'The Animals of the Carboniferous Period, with special reference to discoveries in Yorkshire.' This has since been printed in our journal.

President.—At an Executive Meeting held on November 15th, 1923, Mr. Percy H. Grimshaw, F.R.S.E., F.E.S., was unanimously elected President of the Union.

Field Meetings have been held at Barnoldswick, April 19th to 21st; Holme-on-Spalding Moor, May 17th; Ravenscar, June 7th to 9th; Church Fenton, July 12th, and Darlington, August 2nd to 4th. Reports of these meetings are to be found in *The Naturalist*.

Field Excursions have also been held by the Bryological, Entomological, Micro-biological and Mycological Sections, and notes on these appear in our journal.

The resignation of Mr. J. W. Stather as Local Secretary for S.E. Division has been received with regret. Mr. Stather has held this office ever since its institution, and the Union is greatly indebted to him for his services. Mr. W. S. Bisat has been elected to this office.

The Divisional Secretaries have greatly assisted the work of the Hon. Secretaries in organising the Excursions of the year, often with much inconvenience to themselves and the saving of expense to the Union.

General Committee.—The following Members were elected to the General Permanent Committee at the Annual Meeting :—

W. D. Hincks.	G. Trevor Lyle.	T. Basil Kitchen.
J. N. Frankland.	A. Leslie Armstrong.	W. R. Grist, B.Sc.
Miss E. W. Pilkington.		

Excursions for 1925 have been arranged as follows :—

May 9th.—Egton. N.E.

Whit Week, May 30th-June 1st.—Middleton-in-Teesdale. N.W.

June 25th.—Coxley Valley. S.W.

July 11th.—Flamborough. S.E.

August Bank Holiday, August 1-3.—Malham. Mid. W.

The Annual Fungus Foray will be held at Hackness in September. The Annual Meeting of the Union in 1925 will be held at Huddersfield, on the invitation of the Huddersfield Naturalists' Photographic and Antiquarian Society.

Affiliated Societies.—These have been increased by the addition of the Honley Naturalists' Society; these have now an aggregate membership of 3560, which brings the numerical strength of the Union up to 3972.

Membership.—The present membership now stands at 412; the following were elected during the year :—

Beaumont, A. G., Rishworth Lodge, Rishworth, Halifax.

Belbin, H. L., Moorhill, Totley Rise, near Sheffield.

Brown, F. J., M.A., The University, Leeds.

Chadderton, T., Shaw Hall Bank Road, Greenfield (near Oldham).
 Cherry, Miss A., Cemetery Lodge, Keighley.
 Child, Miss G. V. P., 37 West View, Beeston Hill, Leeds.
 Dibb, Jas., 215 Swan Arcade, Bradford.
 Duncan, J. B., 6 Summerhill Terrace, Berwick-on-Tweed.
 Edmondson, Miss F., The Lindens, Utley, Keighley.
 Herklots, Geoffrey A. C., B.Sc., Trinity Hall, Cambridge.
 Hinks, W. D., 9 Grange Avenue, Chapeltown Road, Leeds.
 Hodgkinson, John, Rose Hill, Penistone.
 Hudson, H. F., 18 The Mount, Malton.
 Ingold, Professor C. K., F.R.S., The University, Leeds.
 Ingold, Mrs. C. K., The University, Leeds.
 Jagger, Miss E. M. A., M.Sc., 46 Mount Preston, Leeds.
 Kitchen, T. Basil, 23 Avenue Crescent, Harehills, Leeds.
 Lowther, R. C., M.B., Ch.B., F.E.S., Fernleigh, Grange-over-Sands.
 Minshall, Miss E., B.Sc., Girls' High School, Halifax.
 Wenyon, Conrad T., M.A., A.I.C., 58 Bankfield Road, Huddersfield.
 Whitehead, H., B.Sc., 62 Brudenell Mount, Leeds.
 Wild, F. D., 2 Weaponess Street, Scarborough.

The Presidency for 1925 has been offered and accepted by Prof. J. H. Priestley, D.S.O., B.Sc., of the University, Leeds.

VERTEBRATE ZOOLOGY.

North Riding (W. J. Clarke) :—For bird life, the year has been an average one, most species, including Swallows, Martins, Swifts, Kingfishers and Landrails, appearing in their usual numbers. Kestrels, Whitethroats, Sedge Warblers, Whinchats, Sandmartins, Moorhens, and, at migration time, Yellow and Grey Wagtails, appeared in greater numbers than usual. A single pair of Yellow Wagtails nested as usual at Scarborough and reared its young. Pied Flycatchers appeared in the Scarborough district in some numbers, and a male was observed in the Whitby district on June 16th. On the other hand Linnets, Greenfinches, Bullfinches and Turtle Doves have been less noticeable than in recent years. The Goldfinch has been numerous in the Whitby district, but less so than usual at Scarborough. Dippers also have seemed scarcer during the past year and have been absent from several of their usual haunts. On April 18th a nest of this species was found near Scarborough built in a tree, the structure being supported by several small twigs at a distance of about six feet above running water. The Reed Bunting again nested at Scarborough Mere, but appears to have deserted its only known site in the Whitby district. A Black Redstart was seen at Whitby on November 17th to 23rd, and several times during December. The Grasshopper Warbler was heard singing in Newton Dale on June 16th. On October 16th and, to a lesser extent, on the following day, a great immigration of Lapwings arrived over the Scarborough area, some of the flocks numbering several hundreds of birds, and scores of such assemblies passing during the two days. Coots have increased in numbers at Scarborough Mere, and have also this year nested for the first time on Throxenby Mere. An adult Osprey visited the Mere on April 30th and May 1st, and during the following week it was seen upon the lake at Hackness. An adult female Little Owl was picked up dead on Wheeldale Moor on August 21st. An immature Spoonbill was picked up dead on the beach at Saltwick on July 3rd. In a recent number of *The Field*, a report appeared recording the nesting of the Golden-eye Duck at Thorp Perrow, near Bedale, where a pair was said to have reared their young. The matter was investigated by Messrs. H. B. Booth and R. Fortune, and the birds proved to be Tufted Ducks. A Pintail Drake was seen on the Esk at Whitby on March 14th. Slavonian Grebes were rather more numerous than usual during the early part of the year. Three were

seen near Scarborough on February 22nd, two upon the Mere near the same place on February 15th, and another on March 10th, staying until the 17th. Others were observed at Whitby on February 17th and March 2nd. A Great Crested Grebe appeared at Whitby on February 28th, and a Red Necked Grebe at the same place on February 15th. About sixteen nests of the Black-headed Gull were observed at Foul Sike on June 9th. A Little Gull in adult plumage visited Whitby on July 30th, and still remained on October 12th, during which time the change to winter dress has been accomplished. The Lesser Black-backed Gull has again nested at Kettleness Cliffs during the spring of 1924. A white-breasted adult Cormorant came into Scarborough harbour in a disabled condition at the end of January, and stayed until May 1st. An adult Black-throated Diver was obtained at Whitby on February 19th. Another in similar plumage was picked up dead at Langdale End on April 3rd. Fulmar Petrels nested in the cliffs at Redcliff and Gristhorpe, south of Scarborough, and also in the cliffs north of the town, but although they visited the Whitby Cliffs they did not remain to breed, and none was seen after July 19th.

The recorder is grateful to Mr. T. N. Roberts, of Scarborough, and Mr. F. Snowdon, of Whitby, for notes which have been of great assistance in compiling this report.

West Riding (H. B. Booth):—The following notes are in addition to those already recorded in *The Naturalist*.

Ducks, Geese, etc.—From Fairburn, Mr. W. G. Bramley reports that a female Smew was shot there on January 16th, and three Whooper Swans were present on February 17th. During the winter, up to the beginning of March, they had several visits of Barnacle Geese, the flocks varying in numbers from ten to forty. The nesting Tufted Ducks were fewer than usual, and had their nests flooded by the heavy rainfall. Mr. H. Dibb saw a 'gaggle' of fifty Wild Geese flying west to east at Cottingley, on February 24th, and a pair of Golden-eyes was on the River Aire, at the same place, on March 16th. Mr. S. Longbottom reported a female Tufted Duck on the Saltaire Boating Club's length of the River Aire, in January. Mr. H. Spencer submitted the head of a female Scaup Duck to *British Birds* (Vol. XVII., p. 213) for identification. It was shot from a small flock on the River Calder, at Elland, on December 27th, 1923.

Gulls.—From most of the breeding stations of the Black-headed Gull the numbers are reported as either about stationary or as decreasing; so it looks as if we had passed the flood tide of the great increase so far as the West Riding is concerned. The only exceptions are from the Oughtershaw Tarn and Keighley Moor colonies, where I hear that there would be quite a hundred nests at each place. I have to thank Mr. Cuthbert Hastings for investigating a reported nesting station of this species on the top of Widdale Fell. He found only six birds and three nests, on the North Tarn, and not any on the South Tarn. The nests were on the south side of the Tarn, and were only just within the West Riding. Stray Lesser Black-backed Gulls were reported during the breeding season, but I cannot hear of any having nested.

Grebes.—Two pairs of Great Crested Grebes again nested on Malham Tarn, and a pair remained for the whole season on Chelker reservoir; but there were no signs of nesting, although they have been watched by several members. The Little Grebe (and also a pair of Coots) nested there. From Fairburn Mr. Bramley reported that Great Crested Grebes returned in their usual numbers, but that very few young ones were hatched, owing to the floods. The Little Grebe was there in good numbers.

Heron.—In the Hubberholme heronry, about eight nests were occu-

pied—the same as last year. I have no report from the Eshton heronry,* and should be obliged for any reliable data of the one at Harewood, especially for the past twelve years. A Heron shot at the rearing ponds of the Ilkley Angling Club in November, 1923, contained 25 yearling Trout, from two to four inches in length.

Quail.—More than a year ago Mr. Rosse Butterfield told me that he was certain that he had heard Quail calling in the Worth Valley during the nesting season of 1923; but he could not spare the time to make further investigation. This year we have it confirmed from that area. Mr. Joseph N. Frankland, of Cowling, wrote on August 5th 'A Quail has nested and successfully reared a brood in one of our meadows in Lothersdale. I first noticed the young ones when we were mowing the meadow on the 19th of July. We have often flushed the old one, and seen the young ones, which were very sharp in hiding. I also found the nest with the old hatched egg-shells in, the largest pieces of which I have kept.' It is well over twenty years since I have heard of a Quail's nest in this district.

Various.—Mr. W. H. Parkin informs me that a Rock Pipit frequented the Bingley sewage beds for two or three weeks in April. He also reports that early in June, on a small grassy knoll near Dibb Scar in Grass Wood, he found such a quantity of broken egg shells that it reminded him of a 'Thrush's stone' with snails' shells. He picked up at the least the remains of fourteen Woodcock's eggs, many more Pheasant's eggs and the remains of one or two Lapwing's, and one Golden Plover's. He visited the spot several times during the next fortnight, and found several more newly sucked Woodcock's eggs; but could never see anything of the marauder, or determine whether it was a Carrion Crow, Rook, Jackdaw or Magpie. But two Carrion Crows, with their young (out of the nest) were about, and he suspected them as the culprits. All the egg-shells examined were quite fresh, and none showed any signs of being incubated; in fact, in several there was left a quantity of fresh albumen. The late date for fresh eggs of the species named rather suggests that their layings had been persistently robbed time after time, from which we can rather sympathise with gamekeepers. Mr. J. Astin reported a flock of about twenty Siskins on the riverside between Saltaire and Cottingley on January 1st. Mr. Sam Longbottom informed me that the same flock remained throughout January, and in February in decreasing numbers, and that six of them were last seen on March 18th.

The spring and summer were cold and wet, the migratory birds were somewhat late in arriving, and generally the nesting season has been a bad one. All game birds have done badly. Many species (*e.g.*, Pied Flycatcher) arrived in decreased numbers. The Blackcap Warbler has come in fewer pairs for several years, until now it is getting to be quite a local bird, as the Corncrake has already become. Others have reported fewer Ring Ouzels, Redstarts and Swallows. On the other hand Swifts are increasing. The feature of this season has been the numbers of late nests, and attempts to raise a second brood with species previously looked upon in this district as single-brooded. I have already quoted Mr. Parkin's record of fresh eggs of the Woodcock, Curlew, Lapwing and Golden Plover in June. Mr. A. Haigh Lumby reports four cases from his garden. On June 28th a Blue Tit was noticed repairing a nest in a box from which a brood had recently left. On July 8th this nest contained three eggs—the beginning of a clutch that was duly reared. This points nearer to a second brood than I have previously known with this species, and for quite fourteen years I have had a nest within two yards of my dining-room window. Early in spring an accident happened to a

* Since the above was written, Capt. J. H. Preston has kindly informed me that in 1924 they nested in Lords Wood, and were quite up to the usual numbers. (H.B.B.)

nesting box in which a pair of Great Tits was building, and the birds were scared away. Later they, or another pair, built in the same box, and were feeding young as late as July 19th. Two broods of Starlings were reared from a nest, or nests, in the same aperture in the gable end of the house. Mr. Lumby has not the full data, excepting that the later brood was being fed in the nest on July 4th. A pair of Common Linnets reared a brood from a nest in his clipped Beech hedge (an uncommon site). On July 20th he found they had built another nest about three feet away in the same hedge, and this contained four eggs. Unfortunately an accident happened to this, and the nest was found partly turned, and all the eggs were broken. A Yellow Hammer, with young in nest, on August 25th (Mr. J. Astin), a Hedge Sparrow with eggs late in August (Mr. A. Malins Smith) and a Greenfinch, from which the young left the nest in my garden on August 14th, are taken from some of the later nesting reports. Mr. Bramley writes that this season the Yellow Wagtail has returned as a nesting species to the Fairburn district, and that smaller numbers of Turtle Doves passed during the autumnal migration. He saw and heard a Willow Warbler on September 28th.

Varieties.—Mr. Rosse Butterfield informs me that a fine variety of the Red Grouse, with a pure white breast, was shot on Rombald's Moor in August. I am pleased to say that the albino female Carrion Crow (*The Naturalist*, 1922, p. 370) is still flying about in the neighbourhood of Buckden, and nested this season again, the young being black. The keeper tells me that she keeps pretty well to the same ground all the year round.

East Riding (E. W. Wade):—After an exceptionally long winter, commencing early in November and lasting till early April, followed a dull, cold and wet season, the only warm weather being a fortnight in June. The absence of sunshine, and particularly the persistent wet and stormy weather, had a most unfortunate effect upon the breeding activities of all the smaller birds. The nesting dates were retarded, second clutches often absent; in many cases the number of eggs was below normal, and sometimes a considerable interval elapsed between the completion of the nest and egg-laying.

The Tawny and Long-eared Owls were normal. In some of the Wold Dales where field voles were plentiful the Tawny Owls laid more than normal clutches. The Barn Owl was below the average or not breeding at all.

Some Peewit's eggs were seen at the end of March, but most of the birds were driven from the nests by frost and cold weather, and many were nesting at the end of May. In Holderness the Peewit as a breeding bird is becoming extinct.

Rooks were a fortnight later than usual in laying, and generally short clutched.

The other Corvidæ were generally below the average in the number of eggs, except the Magpie, which is still on the increase in the Wold Dales, and South Holderness.

The Ducks and Snipe in many cases had first and even second clutches flooded out.

The effect upon the Warblers was most unfavourable. The breeding dates were late; Willow Warblers commencing to lay the third week in May, Garden Warblers and Whitethroats mid-June.

The migrants were not noticeably later in arriving than in 1923, but once here their activities were curtailed by wet and cold. Swallows and Martins were later in arriving, and in no case reared more than two broods. The House Martin was about the same in numbers as usual.

Swallows were below normal in numbers, and less prolific.

Goldfinches show a slight increase over 1923.

Corncrakes show a slight increase on the western edge of the Wolds,

but in Holderness only two breeding haunts were tenanted. In all seven pairs were observed.

Swifts were exceptionally late in breeding, one brood flew from the nest on 18th August. On 31st August several small parties were seen, and the last bird on 10th September.

The malign influence of the Starling upon the breeding of the Great Spotted Woodpecker was forcibly illustrated by a pair of the latter kept under observation. At the second or perhaps the third attempt a pair of the latter had commenced to lay on 9th June. Even at this date the Woodpeckers were ousted by the Starling, the eggs destroyed, and the Woodpeckers, thoroughly unsettled, abandoned the attempt at nidification. In this district the Great Spotted Woodpecker is threatened with extinction on this account.

The wet weather had a most unfavourable effect upon game birds, Partridge generally being very patchy.

The Pink-footed Geese appeared on the Humber on 15th September, but, probably on account of the late harvest, did not flight up to the Wolds till 9th October.

On 16th February a Coot drive was organised at Hornsea Mere, 392 birds being shot.

22nd March.—A Red-necked Phalarope was seen on the lake at Burton Constable.

19th April.—A Pied Flycatcher, male, observed in Boynton Woods.

1st May.—Four Red-spotted Bluethroats, male, at Spurn.

3rd May.—Migrant Thrushes and Redshanks killed at Spurn Light.

7th June and 21st July.—A Lesser Spotted Woodpecker was seen at Ferriby, the first record for the district, but no evidence of nesting could be obtained.

27th June.—A Woodcock was brooding four eggs in Cliffe Wood.

31st August.—A Reeve was observed at Hornsea Mere.

In June, two little Owls were seen at Hornsea Mere.

9th June.—Four youths were shooting at the sitting birds from the beach below Hartley Shoot, on the Bempton Cliffs. The writer was misdirected and failed to get to the telephone in order to ring up the Speeton coastguard. Meanwhile the marauders disappeared.

A pair of Gannets has frequented Black Shelf, at Bempton Cliffs, all the season, driving the other birds away, and it is possible they may breed next year.

The persistent taking of all well-marked eggs at Bempton has resulted in the practical elimination of such specimens. It is impossible even to guess how long it had taken to evolve these types, which have been known for at least fifty years, but the intensive hunt for them during about thirty years has at last done its work.

The Shelduck is extending its breeding range in the upper reaches of the Humber.

With further reference to this Riding, Chas. F. Procter writes:—There is definite evidence that as far as the City of Hull is concerned, a steady incursion of the shyer country birds is taking place. I have frequently seen Chaffinches, Thrushes, Robins, Wagtails and various Tits, Blackbirds and Wrens in the gardens and pavements of those aggregations of houses which were originally designed as garden villages on the suburbs, and are now well within the town. The Pink-footed Geese which are such a feature of the higher reaches of the Humber, Broomfleet and Brough, during the last winter, extended their winter habitat along the northern shore of the Humber eastward as far as Welwick. This is the first time that this species has been known definitely to range this portion of the Humber, although stragglers have constantly been seen. Their numbers were greater than on their last visit. Widgeon were extremely plentiful on the Humber last winter. Kestrels are everywhere this autumn in East Yorkshire.

York District (Sydney H. Smith) :—There appears to be an increase in the numbers of birds classed as vermin by gamekeepers ; Carrion Crows, Magpies, Jays, Kestrels and Sparrow Hawks ; Long-eared, Tawny and Barn Owls have all been fairly numerous. Water-loving birds like Mallard, Shoveler, Wigeon, Pochard and Tufted Ducks have been well in evidence in the Derwent Valley and on Skipwith Common, and the gullery at Skipwith accommodated at least 1500 pairs of Black-headed Gulls. A Bittern frequented the reed pond at the latter place from January 31st to March 11th, and hope was expressed of its finding a mate and breeding there, but this did not materialise. A Bittern, which may have arrived in the district with the one just mentioned was shot at Stockton-on-Forest on January 21st, and was seen by me shortly afterwards. Of late years Hooded Crows have become rare locally, and we now record three that were seen on Hob Moor, York, on February 17th, and another on Strensall Common on March 30th. Several hundred Fieldfares arrived at Stamford Bridge on April 23rd, probably *en route* for the East Coast. Other species noticed on passage were Curlews flying over Fulford on August 13th, Golden Plovers at the same place on August 23rd, and three large flocks of Wild Geese, probably pink-footed, passing over York on October 9th. A pair of Woodcock reared three young ones at Kexby, and another pair got its brood off safely at Sand Hutton. Hawfinches have increased slightly, and a nest with four eggs was found at Aberford on May 29th. On June 4th a nest of the Goldfinch, containing four eggs, was found in a garden at Fulford. Turtle Doves have been seen at various places near York, and maintain their numbers ; a nest with two young ones seen at Ampleforth on June 17th was in the same tree where Turtle Doves nested in 1922. Two pairs of Stonechats had nests filled with young at Huggate on June 9th, and on the same date and place a pair of Common Buntings was observed. The Corncrake has been recorded at Stockton-on-Forest, Fulford, Easingwold and Coxwold, and is apparently rarer than ever in the neighbourhood of York. Nightjars have been exceedingly scarce, and most of their local haunts were left untenanted during the season. A pair of Stockdoves reared two broods in a hole in a tree in the Deanery Gardens at York. Bullfinches, once fairly common around York, are now rare, and I have no note of their nesting this year.

I am greatly indebted to Mr. V. G. F. Zimmerman and Mr. E. W. Taylor for their valuable assistance in helping me with notes for this report.

(To be continued).

Horace Donisthorpe describes *Euplectus decipiens* Raffr., a species of Coleoptera new to the British List, in *The Entomologist's Record* for November.

J. S. Huxley writes on 'The Breeding Behaviour of the Common Heron,' and W. E. Glegg on 'The Nesting of the Flamingo in the Camargue,' in *British Birds* for November.

The Journal of the East Africa and Uganda Natural History Society, No. 19 (18 pp.), the smallest yet issued, is not very pleasant reading. The hope that as a result of opening the museum the progress of the Society would be rapid, has not materialised. The repayment of the debt on the new buildings has precluded the purchase of urgently required fittings, and altogether put out of court the possibility of employing a paid curator. During the year the Society has existed, but not progressed, and the committee was compelled to adopt a policy of forced inactivity. Many specimens had to be destroyed for lack of proper storage. No donations have been received towards the Special Building Fund or Illustration Fund. Owing to lack of support no evening meetings could be arranged.'

YORKSHIRE NATURALISTS' UNION AT SHEFFIELD.

THE Sixty-third Annual Meeting of the Yorkshire Naturalists' Union was held on Saturday, December 6th, in the Church House, Sheffield, the President, Mr. P. H. Grimshaw, F.R.S.E., being in the chair. After the election of two new members and the affiliation of the Austwick Field Club to the Union, the President announced that Professor J. H. Priestley, D.S.O., F.L.S., had accepted the Presidency of the Union for 1925. At this stage of the proceedings, the Lord Mayor of Sheffield, Alderman A. J. Bailey, J.P., arrived, and occupied the chair during the Presidential Address on the Study of Flies (Diptera). At the conclusion of the address, Mr. G. T. Porritt proposed, and Mr. E. G. Bayford seconded, a resolution that the best thanks of the Union be offered to Mr. Grimshaw, both for his address and also for his services to the Union during the year. This resolution was unanimously approved. Votes of thanks were also accorded to the Lord Mayor for his kindness in taking the chair, and to the Sorby Scientific Society and Mr. A. Bayliss, to whom the complete success of the local arrangements was due.

After the Presidential Address the members of the Sheffield Society invited the members to a *Conversazione* in the Church House. After refreshments had kindly been provided, Mr. T. Sheppard, M.Sc., gave an amusing account of 'The Making of a Yorkshireman,' which was followed by some remarks on Local Geology by Mr. W. H. Wilcockson, M.A., of the Sheffield University.

The Annual Meeting for 1925 will be held at Huddersfield on the joint invitation of Huddersfield Naturalists and Antiquarian Society, and the Committee of the Tolson Memorial Museum.

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CORRESPONDENCE.

ARRIVALS OF MIGRANTS AT YORK AND IMMEDIATE VICINITY DURING 1924.

Willow Warbler	March 30th, Strensall ; April 5th, Bulmer.
Chiff-Chaff	March 30th, Strensall ; April 18th, Pickering.
Wheatear	March 30th, York.
Whitethroat	March 30th, Strensall ; April 20th, Thirkleby.
Yellow Wagtail	March 30th, York.
Swallow	March 30th, Strensall ; April 20th, Thirkleby ; April 21st, Alne.
House Martin	April 13th, Sandburn ; May 5th, Alne ; May 5th, Heworth.
Tree Pipit	April 13th, Sandburn ; April 25th, Stamford Bridge.
Whinchat	April 13th, York.
Blackcap Warbler	April 13th, York.
Sandpiper	April 18th, Pickering.
Cuckoo	April 20th, Stamford Bridge ; April 25th, Copmanthorpe ; April 26th, Alne.
Sand Martin	April 20th, Thirkleby ; May 5th, Heworth.
Spotted Flycatcher	April 25th, York.
Landrail	April 30th, York ; April 30th, Fulford ; June 1st, Coxwold ; June 8th, Easingwold ; June 23rd, Stockton-on-Forest.
Swift	May 2nd, Heworth ; May 7th, Sheriff Hutton ; May 9th, York ; May 13th, Fulford.
Turtle Dove	May 9th, Dunnington ; May 30th, Sandburn ; June 9th, Huggate.
Sedge Warbler	May 18th, York.
Nightjar	May 30th, Sandburn.

SYDNEY H. SMITH.

Naturalist



Photo

J. A. Wheldon, M.Sc., A.L.S., I.S.M.

Lafayette.

In Memoriam.

JAMES ALFRED WHELDON, M.Sc., A.L.S., I.S.M.

By the death of Jas. A. Wheldon, at the comparatively early age of 62 years, which took place at his residence, Marchfield Rd., Orrell Park, Liverpool, recently, the botanical world, and particularly the bryological part of it, has sustained an almost irreparable loss ; while Yorkshire and its Naturalists' Union have sincerely to regret the demise of a noteworthy son and an able and enthusiastic student of Nature.

Born at Northallerton, Yorkshire, in 1862, and educated at the Cleveland College, Darlington, and the Westminster College of Pharmacy, J. A. Wheldon qualified in Pharmacy about 1884, and then started business in the City of York. After six years here a disastrous fire destroyed all his belongings, including books, dried plants, and a collection of stuffed birds, together with a large aviary—a fate very similar to that which had befallen the books and herbaria of the late J. G. Baker at Thirsk, ten or fifteen years previously. Neither disaster, however, seems to have militated against the subsequent development of both Baker or Wheldon as distinguished botanists.

After the York conflagration, young Wheldon, having already done much work in collecting insects, birds' eggs and land and freshwater shells, and in practising taxidermy with very successful results, turned his attention to the botanical study of Flowering Plants, but especially to the Cryptogamic orders embracing Sphagnaceæ, true Mosses, Liverworts and Lichens. Wherever located he at once took to the observation and collecting of the natural products nearest at hand, and so, during a short residence at Scarborough he studied the seaweeds, his small collection being still in existence. At this time also he collected largely the leaf-fungi (microfungi) and added many records for Yorkshire to the 'Yorkshire Fungus Flora' by Massee and Crossland as well as to Groves' 'British Rust Fungi.'

In 1891 he was appointed Pharmacist to H.M. Prison, Liverpool, and held this position for over thirty years ; indeed, until his retirement when, as Senior Officer in that Service, he was decorated with the Imperial Service Medal (I.S.M.). During the long period just referred to, Wheldon's leisure time, limited as it must have been, was, nevertheless, all spent in the field observing and collecting, or in the study, identifying the 'finds' of himself and others and writing the large number of contributions which he made to many notable Natural History and Botanical Journals.

In Britain J. H. Wheldon, during the latter years of his life, was undoubtedly our leading bryologist, and was highly esteemed by both British and Continental Bryologists for his

work and the acumen he displayed in his many writings dealing with the identification, description and classification of the Sphagnum genus as well as of that difficult polymorphous group of the true mosses known as the *Harpidioid Hypna*, in both of which Wheldon was an acknowledged expert. Readers of *The Naturalist* will remember his articles in that journal for 1902 on 'The North of England Harpidia' (illustrated), and the still more important 'Key to the Harpidioid Hypna' in the 1920 and 1921 volumes of *The Naturalist*. Wheldon's 'Comments on the *Harpidia adunca* of Sanio' in the 'Revue Bryologique' may not be so well known, although frequently his name is mentioned in this Continental journal.

One of the most noteworthy results of Mr. Wheldon's work in Lancashire was the 'Flora of West Lancashire,' in the writing of which he collaborated with his old botanical friend, Mr. Albert Wilson. This work was published in 1907, and was aptly described by one of the leading British botanists of the time as 'A standard model of what Floras should be and a compilation which is a credit to the authors and a lasting memorial.' In it will be found a useful and interesting chapter on the 'Ecological Survey of the Distribution of the Mosses, Hepatics and Lichens' of West Lancashire.

Besides that for West Lancashire just mentioned, several other well-known Floras owe many of their records to the observations and discovery of J. A. Wheldon. As examples, the following may be mentioned, viz.: 'The Victoria History of Lancashire (Botany),' Green's 'Flora of Liverpool,' Baker's 'North Yorkshire,' Masee and Crossland's 'Fungus Flora of Yorks.', and the 'Flora of the Manx Curraghs,' the last of which was compiled entirely by him.

A list of about ninety works and published articles by J. A. Wheldon lies before me and a perusal of the titles alone is very pleasing and instructive, but space does not permit to give them in detail; while the names of the journals publishing most of them are sufficient guarantee to their great botanical value. Among others, there were the old periodical, *Science Gossip*, which became defunct in 1903; 'The Transactions of local Naturalist and Botanical Societies,' *The Lancashire Naturalist*, *The Naturalist* and especially the *Journal of Botany*, to which very many notes and articles had been contributed by him during the last twenty-five years of his life. It was in the *Journal of Botany* that his last note appeared, dealing with 'Additions to the Scottish Sphagna,' and it gave him pleasure to read a reprint of the same only a couple of hours before he passed away!

As one might expect, J. A. Wheldon was a member of many botanical and kindred societies. He was one of the founders of the Moss Exchange Club of the British Isles, a

member of the 'York and District Field Naturalists,' the 'Liverpool Naturalists' Union' the Liverpool Botanical Society, and other societies mentioned in the foregoing, including our own Yorkshire Naturalists' Union. Long a Fellow of the Linnean Society (F.L.S.), he ultimately had the honour of election to an Associateship of that premier botanical Society (A.L.S.). At the last meetings of the British Association at Liverpool, 1903 and 1923, he made big contributions to the respective Handbooks. To Liverpool University he owed the honour of the degree of Master of Science. Besides much field and written work, Mr. Wheldon frequently lectured with great acceptance to the various societies, generally on some Bryological subject, which was invariably illustrated by fresh or preserved natural specimens, home-made lantern slides or well-drawn diagrams and pictures in Water Colour, at which our botanist was also an adept.

With mention of the splendid Herbaria which he got together and left to be retained, it is hoped, in this country, this all too brief notice of a distinguished man, a genial and kindly gentleman, and an affectionate father, must draw to a close. The Herbaria consist of:—

- (1) A big collection of British and Foreign Phanerogams.
- (2) A complete and representative collection of British Mosses and many foreign ones.
- (3) A similar collection of British and European *Sphagna*.
- (4) A collection of British Hepatics.
- (5) A large collection of British Lichens, and
- (6) The small collection of British Seaweeds.

Two sons and one daughter survive to mourn the decease of their father, who had been a widower for some nine years.—J.F.R.

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The Annual Report and Transactions of the Manchester Microscopical Society for 1923 (50 pp., 1/6), besides its list of members, details of exhibits, lectures, etc., contains an article on 'Rock Textures and Structures from an Applied Aspect,' by Edgar Morton; and 'The Study of Plankton,' by J. Stuart Thomson, both being particularly interesting contributions.

Vol. V., Part 1 of *The Transactions of the London and Middlesex Archæological Society* has just been issued (66 pp.). The new editor is Dr. William Martin, who contributes 'The Earliest Views of London'; 'Ludicus Scenicus'; 'Roman London: Cornhill'; 'Roman London: Cheapside.' There are numerous other notes on similar lines, which must be of great value to the members of the Society.

The Borough of Colchester issues its *Report of the Museum Committee* for the year ended 31st March, 1924 (36 pp., 6d.), which has the usual detailed list of valuable additions during the year, among the illustrations being British vases, a Bronze Age Hoard, various rare types of Roman pottery, Roman glass and tiles, boxes made of decorated curled paper, mediæval pottery, etc. They are from excellent photographs by Mr. A. G. Wright, the Curator.

NORTHERN NEWS.

Among the gifts to a certain museum we notice some mediæval 'bungholes'!

We regret to announce the death of Mr. A. E. Haydock, of Settle, a member of the Yorkshire Naturalists' Union.

The Yorkshire Herald for November 29th records that a badger weighing 38 lbs. was killed at Broughton, near Malton, the previous week.

We notice that a gentleman, who might be called 'Leeds,' considers that Leeds should extend from the Pennine Chain to the sea! Anyway, it would then include one or two museums which would be worthy of so great a city.

The following entry occurs in a London bookseller's catalogue: 'Archæological Pamphlets. Collections of 40 various, reprints and excerpts, from the library of Dr. W. Crooke, by A. Cremona, T. Sheppard, T. J. Westropp, H. S. Crawford, J. Reid Moir, &c., wrapps. 7s. 6d.' Strange bedfellows!

We learn from the press that among the recent additions to the British Museum is 'a rare Angler-fish, *Ceratias holbolli*, caught by a trawler off Iceland, and presented by Mr. T. Sheppard.' If we are to believe all we read in the press, then we can only assume in this case there is a 'catch' somewhere!

A sum of about £2500 has been accumulated in honour of Prof. A. Smithells, formerly of the Leeds University. A portrait by Mr. Fildes Watt has been presented to the University, and the balance of the fund will go towards a scholarship of approximately £100 per annum in the name and with the advice of Prof. Smithells.

In Part XLVIII. of *Type Ammonites*, Mr. S. S. Buckman discusses the Sequences in the Corallian Rocks of Yorkshire, which have now been divided among fifty or more intervals of time. Sequences are given for the Scarborough, Pickering and Hambleton districts, the Howardian Hills and Saltersgate Moor, Whitby.

Mr. O. G. E. Erdtman, of the Botanical Laboratory, Stockholm, has a paper on 'Mittielungen über Einige Irische Moore' in *Svensk Botanisk Tidskrift*, Bd. 18, H. 3, recently issued. In this he continues his well-known micro-palæontological studies of the peats of Ireland, also referring to Cheshire and the Isle of Man, and the 'Moorlog' of the Dogger Bank.

The Journal of Conchology for November contains an obituary notice of A. D. R. Bacchus; 'British Helicidæ,' by A. E. Ellis; and the occurrence of various species of mollusca in Scotland, Ireland, Cumberland, Glamorgan, Sussex, Mewstone, near Plymouth, the Isle of Man and Market Harborough. Mr. J. D. Dean writes on 'Albinism and its known occurrence in European Clausiliidæ,' describing new forms.

The University of Leeds is arranging a course of lectures on the Natural History of Yorkshire, which will do much to popularise the charms of the county of broad acres. The first lecture deals with the Geological History, Present Structure and the Scenery of Yorkshire, and will be illustrated by lantern slides from the Godfrey Bingley Collection. The circular we have received about this course does not give the names of the lecturers.

Hull Museum Publications, No. 137, deals with the Hull Conference of the Museums Association, and includes the discussion on Mr. T. Sheppard's Presidential Address on 'The Place of the Small Museum'; gives an account of the lighter side of the Conference by two of the lady members; and a detailed report of the official visit of the Association to Copenhagen. Publication No. 138 contains the following notes, among others, all being reprinted from *The Naturalist*:—'Hoard of Bronze Axes from East Yorkshire,' 'Red Deer Skeleton from the Holderness Peat,' 'Neocomian Ammonites,' and 'An Early Binocular Dissecting Microscope,' by T. Sheppard; 'The Common Crane Fossil in Britain,' by E. T. Newton; 'A New Fossil Fish from South Ferriby, Lincs.', by A. Smith Woodward; and 'New Speeton Ammonites,' by L. F. Spath.

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The Manchester Guardian says:—"This is a readable, popular history from the New Stone Age to the fifteenth century, with chapters on the feudal system, on the numerous monasteries in the district, and on the daily life of monk and layman in the Middle Ages. In the period to which it relates the Riding was the scene of many foreign invasions and of much civil war, and the author's object has been to show the relation of the local history to that of the nation. The volume contains many illustrations, and the price is astonishingly low for so handsome a work."

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Jan., 1925.

FEB., 1925.

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THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL
PRINCIPALLY FOR THE NORTH OF ENGLAND.

EDITED BY

T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums Hull;

and T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Technical College, Huddersfield,

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

G. T. PORRITT, F.L.S., F.E.S.

JOHN W. TAYLOR, M.Sc.

RILEY FORTUNE, F.Z.S.

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YORKSHIRE NATURALISTS' UNION.

VERTEBRATE SECTION.

President of the Section : F. H. EDMONDSON, Keighley.

Two meetings will be held in the Library of the Leeds Philosophical Society on **Saturday, February 21st, 1925, at 3-15 p.m. and 6-30 p.m.**

Papers will be given as follows :—

'Animal Psychology,' by C. F. PROCTER.

'Bird and Animal Legends,' by W. G. BRAMLEY.

'Some of our Rarer British Breeding Birds,' by T. M. FOWLER, F.R.P.S.

Members or Associates are invited to attend and bring notes, specimens and lantern slides.

Will Officials of Affiliated Societies kindly notify their members.

E. WILFRED TAYLOR, *Hon. Sec.*,
10 Telford Terrace, York.

DIPTERA COMMITTEE.

By kind invitation of the Bradford Natural History Society, a Meeting will be held in the Biology department of the Bradford Technical College on Monday, February 23rd, at 7-30 p.m., when Mr. George Grace, B.Sc., F.E.S., A.R.C.Sc., will read a paper on

'An Introduction to the Study of Yorkshire Chironomids.'

This will be illustrated by lantern slides. All Yorkshire Naturalist Union members and associates are invited.

CHRIS. A. CHEETHAM.

BOOKS WANTED.

Alford Nat. Hist. Soc. Reports. Set.
Bath Field Nat. and Arch. Soc. Vols. VIII.-XI.
Brighton and Sussex Natural History Society Reports, 1870-1874 3.
Burnley Lit. and Sci. Soc. Parts 8, 13, 14, 16, 17, 18, 19, 21, 23, 24, 25.
Chester Soc. Nat. Science: Ann. Reports, i.-iv.
Cleveland Lit. & Phil. Soc. Trans. Science Section or others.
Croydon Nat. Soc. 6th Report.
Dudley and Midland Geol. etc., Soc. Vols. II.-IV
Discovery. (Liverpool, 4to). 1891.
Derby Arch. and Nat. Hist. Soc. Part 21.
Devonshire Assoc. Adv. Science. Vols. I., II., III.
Dublin Geol. Soc. Vol. I., pt. 1, 1830?; Vol. VII., parts 1-3 (or complete Vols.). 1855.
Eastbourne Naturalist (1 part).
Eastbourne Nat. Hist. Soc. Vols. II.-III. (or parts), and part 6 of new series.
Frizinghall Naturalist. (Lithographed). Vol. I., and part 1 of Vol. II.
Geol. and Nat. Hist. Repository, Mackie's. Vols. II., III.
Geol. Assoc. Proc. Vol. I., Part 1.
Geol. Soc., London, Trans. 2nd ser., Vol. VI., and Pts. 1-3 of Vol. VII (or Vol.).
Geological Magazine, 1894.
Huddersfield Arch. and Topog. Society. 1st Report, 1865-1866. (38 pp.).
Illustrated Scientific News. 1902-4. (Set).
Journ. Micrology and Nat. Hist. Mirror. 1914—
Keighley Naturalists' Society Journal. 4to. Part 1.
Lancs. and Cheshire Antiq. Soc. Vols. IV., V., VIII., XXVI.
Louth Ant. and Nat. Soc. Reports, 1-12, 19.
Liverpool Geol. Association Proc. Parts 1, 3, 16.
Liverpool Nat. Journ. Parts 1, 3, and 20.

Apply—Editor, The Museum, Hull.

NOTES AND COMMENTS.

PROFESSOR J. H. PRIESTLEY.*

'The Yorkshire Naturalists' Union is to be congratulated upon having secured for its President during the coming year Professor J. H. Priestley, B.Sc., D.S.O., F.L.S., the Professor of Botany in the University of Leeds. Professor Priestley has done great service to his science by his work in Leeds, and has won high fame for his department of the University, not merely as a teacher—though in that capacity his influence will be as widely felt as that of any teacher of his generation—but also as an original investigator. In some of the most vital questions relating to the growth of plants and their reaction to particular soils his researches are proving revolutionary. Sir Humphrey Davy was once described by a Scotsman as a "varry troublesome pairson" for upsetting so sadly the preconceived notions of the science of his day. Professor Priestley is upsetting ideas, too, but by way of recompense making order and precision out of confusion and error. He has long been an active worker with the Union on its field-excursions, and his enthusiasm will, one is confident, keep him from joining the ranks of those who after their year of office is over are never, or rarely, seen in the field again.'†

AGES OF PENNINE PEAT.

With the above heading, Dr. W. H. Pearsall, in *Nature*, No. 2875, reviews the recent work on this interesting and difficult question, putting particular stress on the excellent and detailed work which has recently been accomplished in the Huddersfield area. Here, among trees at the base of the Peat, was a horn [? core] of *Bos primigenius* (the Urus of Cæsar, living in Roman and later times), and 'a' triangular arrow head of the Neolithic-Dolmen period. At a somewhat higher level, a piece of bronze and 'a' barbed arrow head suggest the Bronze-age horizon. It seems to us that, like the Scotsman's 'aye' button, these two flint arrow heads bear a great responsibility! It is surely unfortunate that 'a' triangular arrow head should be considered to suggest the 'Neolithic-Dolmen' period, in an area where Neolithic Dolmens do not occur, and similarly unfortunate that a 'Bronze-age horizon' should be suggested on the strength of a piece of bronze and 'a' barbed arrow-head which seems to be similar to the thousands of undoubtedly neolithic arrow-heads found on the Yorkshire Wolds. When Dr. Pearsall tells us that, on the strength of a single flint, the Neolithic-Dolmen period is apparently indicated at the base of the Peat, and we learn of the evidence of the 'Belgian Tardenois culture (every-

* From the familiar 'Nature Lover's Diary' in *The Yorkshire Post*.

† This is quite true, though in some cases their noses are kept well to the grindstone, in the interests of the Union, indoors.

thing seems to point to a 'culture,' whatever that may mean, nowadays!), also to the 'later Tardenois period,' etc.; we think our botanical friends would do well carefully to record what they can on purely botanical evidence, leaving the findings of the enthusiasts known as 'prehistorians' to those who consider they are capable of interpreting the evidence produced by two arrow-heads.

THE GEOLOGICAL CLUB.

Recently the members of the Geological Society Club dined together as usual after the meeting of the Society. The occasion, however, was a special one, being the exact centenary anniversary of the first dinner of the Club in 1824, and a number of distinguished guests were invited to take part in the celebration of the event. Sir William Boyd-Dawkins, who was already a member of the Club fifty years ago when its jubilee was celebrated, proposed the toast of kindred clubs, which was responded to by Sir Charles Sherrington, President of the Royal Society. Sir Arthur Smith Woodward proposed the guests, to which Sir Richard Gregory and Prof. Schaffer, of Vienna, responded. Sir William Bragg proposed the toast of the Club, and Dr. J. W. Evans, in replying, reminded those present of the great changes in geological science since the Club was founded. Then there were no Cambrian, Ordovician, Silurian, or Devonian periods, and the Tertiary had not been subdivided by Lyell, one of the founders of the Club, who survived to take part in its jubilee. There was no glacial period, prehistoric man, or evolution—no rock sections or petrological microscopes. Dr. Evans referred to the importance of the office of treasurer, and proposed the toast of past holders of that post, and more especially of the present treasurer, Mr. G. W. Lamplugh, who, in responding, remarked his indebtedness to Prof. W. W. Watts, and on the curious coincidence that both at the jubilee and the centenary dinners the president was a John Evans.

PHYTOPLANKTON.

We learn from *Nature* that at a recent meeting of the Linnean Society 'Mrs. [? Messrs.] W. H. Pearsall and W. H. Pearsall gave: "Phytoplankton of the English lakes." These lakes fall into three groups according to their plankton types: (1) those with green Algæ dominant; (2) those with Dinobryon dominant; (3) those with diatoms and Myxophyceæ dominant. This classification agrees very exactly with their classification according to physical characters, water analyses, and rooted vegetation.—B. M. Griffiths: *Studies in the phytoplankton of the Lowland Waters of Great Britain: the phytoplankton of Shropshire, Cheshire and Staffordshire*. The natural waters of Shropshire and Cheshire frequently

show "water-bloom," due to a prodigious development of blue-green algæ. The algal flora of the district is poor in desmids. One new desmid, a remarkable twisted form, was found in Marbury Mere, and named *Closterium tortum*. In general, these Lowland waters resemble those of the European plain, and differ from the lakes of the British mountain areas.'

ORDNANCE SURVEY MAPS.

As a result of the agitation by the Corresponding Societies Committee of the British Association for the Advancement of Science, and numerous other bodies, we have been advised by the Ordnance Survey Office that the quarter sheets of the 6-inch Ordnance Survey Maps are to be restored, and that those counties which have been republished recently in full sheet form will revert to quarter sheet form on a reprint or revision, whichever comes first.

A HUMBER WHALE IN 1604.

In *Lincolnshire Notes and Queries*, No. 142, Mr. W. A. Cragg gives the following account of a whale stranded at Skitterness, near Goxhill, in 1604. It was written by George Booth on a fly-leaf of an ancient survey of the Lands at Thornton Abbey, 1580 :—' The XXIth of october beinge sundaye 1604 was a great and monstus flyshe taken upon the Goxhill shoore upon the nesse beinge in lengthe from the foremost pt of her nosse to the utmost grave of her taill XXIII the yards & on [one] foot her eyes stod in the wykinges of her mouthe being from theme to the formost pt of her nosse XIIIth foot the bredth of her taill betwixt the graves of it XIII foot the thыckness of her rownd about by estimation XXVIth foote her belly was whit & plyted lyck to the plyte of a matris every plyght about tenn inches brod her eyes war not muche bigger on of them then a peny whit loose upon the rydg of her backe against the plassh wher her eies stood ther was tow slyts about XII inches long the on distant from the other about a spane wherat she breathed & not at her mowthe she had innuerabl thin bones standing in the roof of her mouth edgwise as comes [combs] might stand in a boxe she had no tethe her tunge lay in the side of her chap the on half of it as much as tow half was soft as any fyle the bredth of her mouthe at the wyking from one syed to the other abowt X foote she was taken alyve & they did cut her tail half of to kyll her wherat the blod came out in marvelous great quantity and as hoot [hot] as any oxe blod is in his belly & before she died she was as hoot upon the outsyed as any horse is when he is sore ridden her skyn was blewishe black not much unlyke the leades of the church she was rydged upon the back as it might be a boot wthe botm upwards by comparyson the dystance betwixt her tow eies X foot she was a maill fish

————all this I did se wthe myne eies & did mesuer her myself saying I did not see her alive.'

BRITISH ASSOCIATION, 1896 AND 1923.

The two last Liverpool meetings of the British Association form the theme of the Presidential Address of Mr. W. S. Laverock to the Liverpool Naturalists' Field Club, and printed in its Proceedings recently to hand. The President does not consider that the 1923 meeting compares at all favourably with that of 1896. He points out that, while the arrangements for the 1923 meeting were in progress one heard many complaints made and great dissatisfaction expressed at the way the University had arrogated to itself the right to run the B.A. meeting, ignoring practically entirely the existence of all the amateur scientific societies of Liverpool, such as our own, and failing to recognize the existence of the City Museum by not placing the Curator of the Museum on the Local Committee, in spite of the fact that only the previous year at Hull, which is not yet blessed with a university, the curator of the Hull Museum had, as joint local secretary, along with the Town Clerk of Hull, run a very successful meeting of the B.A. The University either forgot or quite overlooked the full title of the B.A.—The British Association for the Advancement of Science—and they probably never looked up the objects set out for the B.A. by its founders, one of which is 'to bring science more before the public eye, and to take measures to advance its interests,' for they surely did not imagine that they could best advance the interests of science in the district by ignoring all the existing scientific societies of the district, albeit they are largely composed of amateurs. They evidently preferred to act by themselves instead of acting all together with the existing scientific societies and the City Museum authorities. If the Town Hall had been large enough for the guests for the Lord Mayor's soiree there would have been no public function held in the Liverpool Museum in connection with the 1923 meeting!

HARMFUL FIELD VOLES.

In an article on 'The Field Vole' in *The Journal of the Ministry of Agriculture* for December, Prof. J. Arthur Thomson states: 'On three counts at least there is a strong case against field voles. First, they destroy the pasture by eating the bases of the grass stems. They sometimes do similar damage in corn fields and they are fond of clover leaves and the like. Second, their networks of tunnels underneath the surface of the ground may seriously disturb seed beds and young roots. Thus they do much damage in disturbing as well as in devouring. Their tough summer nests, made of dried grass, are sometimes troublesome to the reaping machines. Third, they

often ring young trees, cutting off the bark just above the ground. They may also nibble through the roots. A common preventive is to surround the base of the tree with a cylinder of wire-netting of narrow mesh, pressing the lower edge of the cylinder well into the ground. A poison wash mixed with starch and glycerine may also be brushed on to the base of the tree.'

MARINE BIOLOGY.

The Journal of the Marine Biological Association, Plymouth, issued in November (pages 319-530, 7/-) contains a wealth of valuable papers as a result of the researches carried on at Plymouth. Mr. W. R. G. Atkins writes on 'The Vertical Mixing of Sea Water and its Importance for the Algal Plankton'; and 'The Hydrogen Ion Concentration of Sea Water in its Relation to Photosynthetic Changes'; Marie V. Lebour on 'The Food of Young Herring,' and 'The Euphausiidae in the Neighbourhood of Plymouth and their Importance as Herring Food.' There are also papers on 'Temperature and the Viscosity of Protoplasm,' by C. F. A. Pantin; 'The Moulting and Growth-stages of *Gammarus*, with descriptions of the Normals and Intersexes of *G. chevreuxi*,' by E. W. Sexton; 'The Zoa of *Eurynome aspera*,' by Robert Gurney; 'Malignant Tumours in Fishes,' by Jas. Johnstone; 'The Food of *Calanus finmarchicus* during 1923,' by Sheina Marshall; and 'Notes on *Haliotis tuberculata*,' by T. A. Stephenson. A particularly valuable section of the Journal is that devoted to abstracts recording work done at the Plymouth Laboratory. These give an unexpected idea of the enormous number of publications in which the results of the researches at Plymouth are recorded.

LIVERPOOL GEOLOGISTS.

We have received Part I. of the Fourteenth Volume of the *Proceedings of the Liverpool Geological Society*, edited by C. B. Travis, in its familiar pink cover, which we remember ever since we undertook the geological bibliographies, on the suggestion of the late W. D. Roebuck, which have appeared in this journal since 1893—over thirty years ago! The present is a substantial publication, and contains Professor P. G. H. Boswell's Presidential Address on 'Some Further Considerations of the Petrology of Sedimentary Rocks'; 'An Exposure of Glacial Sands and Gravels at Willaston-in-Wirral,' by T. A. Jones; 'On two Olivine-Dolerite Dykes in Snowdonia,' by David Williams; 'Petrography of the Triassic Sandstones of South-West Lancashire,' by Stella W. Harris; 'The Attachment of the Ammonite-Siphuncle,' by E. Neaverson; 'Note on some Andalusite-bearing Rocks in Hong Kong,' by W. Schofield; and 'Notes on the Petrology of Penmaenmawr Mountain,' by H. C. Sargent. It is pleasing

to note the prominence given to local geology in this publication, and it is satisfactory to find a lady taking her place in the scientific work of the Liverpool district.

FOSSIL WORMS.

At the recent annual meeting of the Yorkshire Geological Society, 'a paper was given by Mr. J. W. Stather upon a recent discovery made on rocks at Blea Wyke, near Scarborough, of peculiar markings, which have proved to be the tracks of a hitherto unknown worm, which lived in the Estuarine sands of the Jurassic period. An elaborate paper by Dr. F. A. Bather, F.R.S., of the British Museum, was presented, in which the name "statheri" was given as a specific name to the "new" worm. This was intended as a compliment to the discoverer.' Prof. E. J. Garwood, F.R.S., was elected President of the Society for the coming year.

GEOLOGY AND THE ARTS.

At the same meeting, 'Mr. C. N. Bromehead, who is in charge of the re-survey of the Yorkshire coalfield, now being conducted on behalf of the Government, gave an interesting address on "Geology in Relation to the Arts." With the aid of a very fine series of lantern pictures, he showed the intimate connection between the geological nature of a country and the development within it of the arts of architecture and sculpture. The Assyrian civilisation grew up in an area destitute of stone. Brick was the only building material, and a photograph of the temple platform of Ur of the Chaldees—where Abraham lived—was shown to demonstrate the characteristic "batter," or slope, which soft bricks inevitably developed. The Egyptian civilisation was Deltaic in origin, and began with brick aided by timber, or tightly tied bundles of reeds. When it expanded into a granite country, the brick tradition long dominated the art. Greek architecture was based, not upon brick, for it had no brick-clays, but upon timber construction. The fluted columns began as imitation tree trunks. Coming to our own land, the lecturer showed how in the Cotswolds and the Halifax neighbourhood the old houses of local stone seemed to "grow out of the ground."'

DIATOMS AND HERRINGS.

At the Annual Meeting of the Leeds Naturalists' Club, held recently, Mr. T. B. Roe was elected President for the coming year. The retiring President, Dr. W. H. Pearsall, gave an address on 'Periodicity in Nature, with Special Reference to the Natural History of Man.' Dealing first with observations which he had made in studying the abundance or dearth of diatoms in several of the lakes in the English Lake District, Dr. Pearsall said that these algæ were more abundant in summer than in winter, and that their numbers were related

to the quantity of nitrates in the lake waters. This factor was determined largely by the extent of heavy, or flood rainfall, which carried down nitrate containing material, and these flood rainfalls were dependent on climatic conditions. By means of graphs, Dr. Pearsall showed that the curve for diatom abundance agreed with that for flood rainfall. By means of further graphs he showed that if these respective curves were followed for a number of years it was seen that not only was there a seasonal periodicity, but that a period of years showed curves indicating definite cycles of favourable and unfavourable periods in which the flood rainfall, and consequently the abundance of diatoms was greater or less. Similar variations were to be observed in relation to the moon's phases, abundance of diatoms being greatest at full moon ; and similarly we could observe solar periodicity. Seeing that both fresh water and salt water fish fed largely upon diatoms and similar organisms, it was not surprising to find that record catches of herring show a well-marked periodicity, particularly good catches being experienced about every 18.6 years.

THE LEEDS UNIVERSITY.

During the recent coming-of-age celebrations at the University of Leeds, various congratulatory addresses were presented, including one from the Yorkshire Naturalists' Union, of which the following is a copy :—

' To the Chancellor of the University of Leeds.

' The Yorkshire Naturalists' Union, representing thirty-eight Natural History, Literary, Philosophical and other Scientific Societies located in this County, a complete list of which is appended, sends Greetings, and offers its very hearty Congratulations to the University of Leeds on the auspicious occasion of its Coming of Age.

' Throughout the fifty years which have elapsed since the inception of the Yorkshire College of Science, there has always existed a bond of sympathy with the Union which has increased rather than diminished during the period of twenty-one years which the University now celebrates. The recognition of the value of amateur work in various branches of Geology, Botany and Zoology, by Heads of Departments of the University, has been a source not only of satisfaction, but of stimulus, and the Union desires to express its keen appreciation of the breadth of vision which has always marked the attitude of the University towards the work and aims of the Yorkshire Naturalists' Union.

' Among its many distinguished Past-Presidents the Union enumerates with pride—Professor P. F. Kendall, M.Sc., F.R.S., and Professor W. Garstang, M.A., D.Sc. It is a happy coincidence that the Union looks forward to

progress in 1925 under its newly-elected President,—Professor J. H. Priestley, D.S.O., B.Sc., whilst it retains, in the capacity of one of its Honorary Secretaries, the valuable services of Dr. W. H. Pearsall.

‘The Union also remembers with gratification the honour signalled by the University in the conferment of degrees *honoris causa* upon its officers, Messrs. T. Sheppard and J. W. Taylor, Dr. T. W. Woodhead and the late Mr. W. Denison Roebuck.

‘It is the sincere wish of the Yorkshire Naturalists’ Union that the University of Leeds may continue to flourish ; that its role in public Education, in Science, in the Arts, and in Industry may continue to expand, and that it may ever remain in the forefront of the Universities of the Empire as a seat of erudition and learning.

‘Signed on behalf of the Executive of the Yorkshire Naturalists’ Union.

‘Dated 15th day of December, 1924.

Harry B. Booth, *Vice-President*.

F. A. Mason, *Hon. Secretary*.

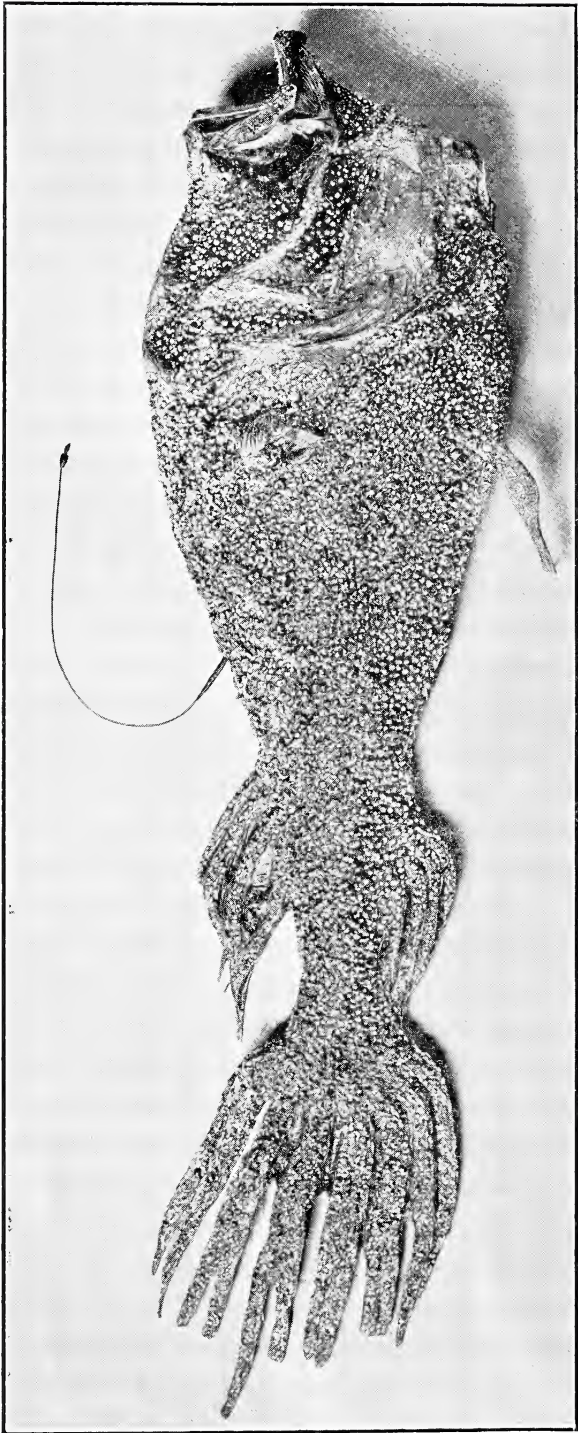
E. Hawkesworth, *Hon. Treasurer*.’

DESTRUCTION OF RARE BIRDS.

Bird Notes and News, Vol. XI., No. 3, contains the following note : ‘Records of the senseless destruction of rare birds are never lacking in scientific publications. The latest issue of the *Hastings Naturalist* reports the shooting of a Kite at Wittersham, February 26th, a Honey Buzzard at Beckley, September 22nd, a Bittern at Jury’s Gap, Kent, February 24th. Sheffield newspapers tell of the shooting of a young Osprey at Stanington, near Sheffield, on the ground that it “attempted to attack” some chickens and pigeons. It is, it is added, a particularly fine bird and is “regarded as a valuable specimen” by an expert from the local museum. But, after all, what is the use of experts and museums if they teach the populace nothing of the greater value of “specimens” as a living glory of the countryside, or even inform them that Ospreys do not dine off chicken? The persons who know details of these disgraceful shots are careful not to afford information to the Royal Society for the Protection of Birds, or to express any of the feeling they would show at the theft of a jewel or a bit of plate which money can replace. It is “not their business” to help in enforcing the law, however often they may decry the law as a dead letter.’

—: o :—

E. A. Butler contributes ‘Notes on the Early Stages of British Heteroptera,’ and R. S. Bagnall ‘New and Rare British Thysanoptera (in which several north-country species are dealt with) to the *Entomologist’s Monthly Magazine* for December.



Ceratias holbolli.

Photograph of cast of female fish, 40 inches long, from Iceland, with a male, 4 inches long, attached to the abdomen.

A RARE ANGLER FISH (CERATIAS HOLBOLLI) FROM ICELAND.

C. TATE REGAN, M.A., F.R.S.,
British Museum (Natural History).

(Plate II.)

A FISH trawled off Iceland was landed at Hull in May, 1924, and was presented to the Hull Museum by Mr. J. C. Pettman. Mr. T. Sheppard forwarded it to the British Museum (Natural History) for preservation.

This fish, which is 40 inches in total length, is a large example of *Ceratias holbolli* Kröyer, a very rare fish, first described in 1844, and hitherto known from only six specimens. 18 to 40 inches long, taken in rather deep water off Nova Scotia, Greenland and Iceland. *Ceratias holbolli* is an Angler-fish, using the term in a wide sense to include all those fishes which have the first ray of the dorsal fin placed on the head and modified into a line and bait ; but the group to which it belongs, the Ceratioids, differ considerably in structure and in habits from our common Angler (*Lophius piscatorius*).

Most of the Ceratioids are oceanic, living not at the bottom but in the middle depths, from about 250 to 750 fathoms below the surface, where there is no light. They are blackish in colour, have very small eyes, and attract the fishes on which they prey by means of a luminous lure. *Ceratias* differs from most of the others in living farther north, in colder waters and at a lesser depth.

The specimen sent to the British Museum has two features of special interest. The first dorsal ray, or 'line and bait,' which is usually present on top of the head, has been lost, and apparently as a consequence of this the second ray, placed on the back far behind the head, is longer than usual, and has a terminal swelling ; it seems to have assumed the structure and function of the first ray. Of much greater importance is the fact that a small fish, 4 inches long, is firmly united to the larger one in the mid-ventral line, below the gill-openings. Investigation has proved this to be a male of the same species, dwarfed and parasitic on the female. The male is incapable of feeding itself, and appears to be nourished by the female, the blood systems of the two being continuous ; the gut is vestigial, and the only organ of importance in the abdominal cavity is a large testis. Similar dwarfed males parasitic on the females have been found in two other genera of Ceratioid Fishes, and it is suggested that this habit has originated from the conditions of life of the Ceratioids, few in numbers, solitary, sluggish, wide-ranging and living in the dark ; in such circumstances it would be difficult for a fish

ready to breed to find a mate. Hence, probably soon after they are hatched, when they are comparatively numerous, such males as are lucky enough to meet females, fasten on and begin their life-long attachment.

A more detailed account will appear in *The Proceedings of the Royal Society*.

Ceratias holbolli was previously unrepresented in the National Collection, and Mr. Sheppard saw the importance of leaving this remarkable fish in the British Museum, where it will be preserved in spirit, and will be readily accessible for study to the many zoologists who visit that institution. Mr. F. O. Barlow, of the Geological Department, has made a coloured plaster cast of the fish (a very difficult operation owing to its spiny skin) for exhibition in the Hull Museum.

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Seasonal Notes on the Rhopalocera,' by S. G. Castle-Russell, occurs in *The Entomologist's Record* for December.

'Observations on the Hatching of the Field Slug, *A. agrestis*,' by H. W. Miller, and 'Scottish Wrens,' by R. Meinertzhagen, appear in *The Scottish Naturalist*, No. 149.

The Report of the Manchester Museum for 1923-24 (Publication 88, 20 pp., 6d.) gives a summary of the work in the different departments, lists of museum lectures, and of the principal donations to the Museum.

The Murrelet for September, issued by the State Museum, University of Washington, Seattle, contains notes on Bird Stomachs and their Contents, by J. H. Bowles; and Winter Colony of White-crested Cormorants at Bellingham Bay, Washington, by J. M. Edson, etc.

An interesting discussion on the use or abuse of the word 'Scientist' appears in a recent issue of *Nature*, and apparently there is much to be said on both sides. It will be interesting to see whether, as a result, *Nature* in future will sanction the use of the word in its pages; hitherto it has not done so.

'Fossil Arthropods from the Tyne Coalfield' is the title of a paper by E. L. Gill in *The Geological Magazine*, No. 724. The author figures and describes some new forms. In the same journal G. W. Robinson suggests the word 'Pedology' for the scientific study of soils. In No. 725 S. Melmore describes a Quartz-porphry from the Lake District.

The New Phytologist for December has, among others, the following papers:—'An Anatomical and Physiological Study of the Petiole in certain species of *Populus*,' by W. Leach; 'The First Sugar of Photosynthesis and the Role of Cane Sugar in the Plant,' by J. H. Priestley; and 'The Vascular Plants characteristic of Peat: a Criticism,' by M. C. Rayner.

The Essex Naturalist, Vol. XXI., Part 1, contains Sir Arthur Smith Woodward's Presidential Address on Pleistocene Mammalia; 'Some Observations on the Leaf-cutting Bee and its Parasite,' by H. Mothersole; 'The Elephant-bed of Clacton-on-Sea,' by S. H. Warren; and 'Collecting and Curating Fruits and Seeds for the Study of Local Dispersal,' by T. A. Dymes.

The Entomologist's Monthly Magazine, No. 726, includes among other notes, 'Oxford Butterflies in the Season of 1924,' by J. J. Walker; Contribution to our knowledge of the Life-history of *Heterocordylus genistae* Scop.,' by J. M. Brown; 'A New Bregmatothrips (*Thysanoptera*) from England and Holland,' by J. R. Watson; and 'The Diptera pollinating the flowers of *Aristolochia siphon*,' by J. W. Carr.

AN ADDITION TO THE AMMONITES OF THE YORKSHIRE LIAS.

C. THOMPSON, B.SC.

It is common knowledge that there was a marvellous outburst of ammonite life in the seas of the Triassic 'Mediterranean Province.' During that period, or at least for the greater part of it, this British region was more or less a desert, or salt lakes; therefore there were no ammonites here. Towards the close of the Triassic period the Mediterranean Sea of the time stretched out into these regions, bringing in early Liassic times ammonites here for the first time.

At this transition period in that part of the world now occupied by the North Eastern Alps, there were four dominant genera — *Psiloceras*, *Caloceras*, *Waehneroceras*, and *Schlotheimia*. The first is known to the naturalists of Yorkshire by '*Am. planorbis*,' the second by '*Am. johnstoni*'; the third was not recognised in England till quite recently; the fourth was known through '*Am.*



Waehneroceras sp.

angulatus.' So that apparently three of the above genera migrated into this area in the order given, but one did not. This was rather strange, for the genus absent from our lists was very well represented in the Alpine region.

On Saturday, 1st November, 1924, some students from the Geology Class at the Hull Technical College found an ammonite in a good state of preservation in one of the Old Lias pits near the North Cliff Road, East Yorkshire. It was submitted to the writer who noted it as an example of the missing genus. It was sent to Dr. Spath, whose attention was also called to another specimen given one or two years ago by Mr. J. W. Stather to the writer, and recently sent by him to the Hull Museum. This second specimen was from the same pit, and was also considered by the writer to be a species of the same genus.

Dr. Spath replied that both were species (probably new)

of the genus in question, and that *Waechneroceras* could now be recorded as found in Yorkshire.

He will in the near future describe them from the palæontological aspect.

Both specimens are now the property of the Hull Museum, where they can be seen.

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We are asked by Mr. S. Morris Bower, of Langley Terrace, Huddersfield, to appeal to our readers to assist him in preparing the Annual Record of winter thunder-storms, hitherto prepared by Mr. C. J. P. Cave for the Meteorological Office. He would gladly send a schedule showing the information he requires to anyone who would assist him, on receipt of a postcard.

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The Wonder Book of the Wild, by Harry Golding. London: Ward, Lock & Co., 256 pp., 6s. net. This delightful account of strange men and animals in strange countries would make a charming present for the young naturalist. There are coloured illustrations of queer birds and mammals, and a wonderful collection of prints from photographs showing big game in various parts of the world. The volume is very well produced and remarkably cheap.

The Great Little Insect, by Evelyn Cheesman. London: Hodder & Stoughton, vi.+256 pp., 6s. net. The Curator of the Insect House at the Zoological Gardens has been prevailed upon to bring together some notes of general interest on the insect's place in nature, its Grip on Life; its Equipment; its Social System; its Mental Equipment. These general headings are sub-divided, appearing under such subjects as Protective Measures; The Use of Thread; White Ants; Social Insects; Mechanical Impulses, etc. Many forms of insect life seem to be dealt with, including butterflies, ants, wasps, dragon flies, etc.

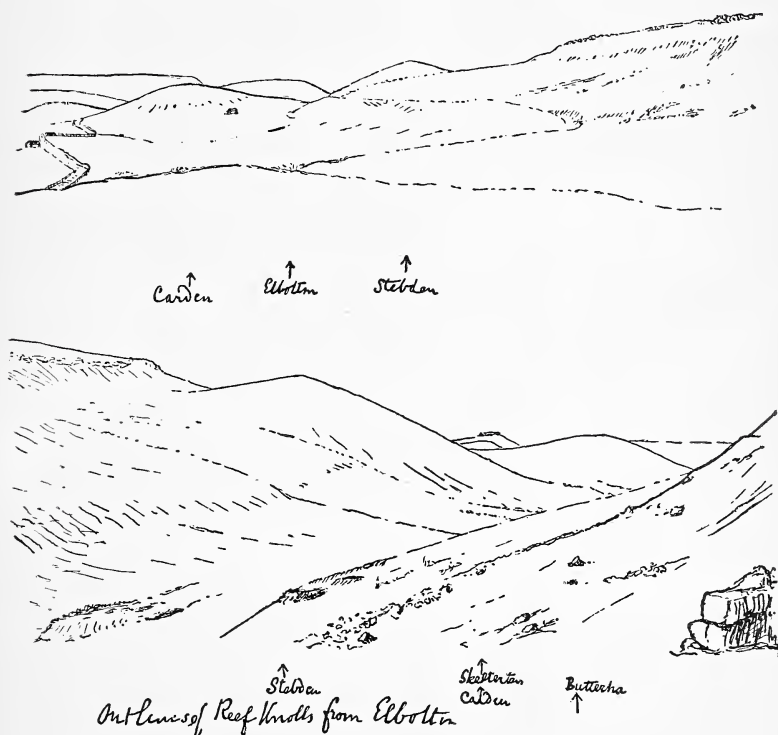
Broadland Birds, by E. L. Turner. London 'Country Life,' xvi.+172 pp., 15s. net. Our readers have long been familiar with the references we have made to the excellent photographs by Miss Turner, and in the present handsome volume she has brought together various articles and illustrations which have appeared in *Country Life*, *British Birds* and other well-known publications. Those who admire bird photography will be as delighted with the wonderful series of photographs herewith reproduced, as with the narrative written by Miss Turner on her observations of the birds of the Broadland. The plates are printed on both sides, and the paper on which the text appears might be better, but perhaps one ought not to complain in view of the comparative cheapness of the volume.

Round the World With Rod and Rifle, by P. M. Stewart. London: Thornton Butterworth, Ltd., 296 pp., 21s. net. The author of this work at first puzzles us by placing a representation of some trophy on the back of the book; whether this is a shark's head or a tiger or a cowri it is difficult to say, though its object may be merely to excite our curiosity! He has travelled in various parts of the world, accompanied by his wife, and the narrative is largely an account of the way in which he collected his wonderful series of trophies shown on photographs on the title page. The author seems to be as keen an angler as he is a shooter of big game. Besides having made seven journeys round the globe, he has made special tours through Canada, the United States of America, Central Africa, South America, Australia, New Zealand and the South Sea Islands. The book contains a description of these tours, with photographs and sketches of the places he has visited, and the animals he has caught. There are also photographs of natives, etc., likely to interest the ethnologist. The volume is a useful addition to the large library of books on travel which has appeared since the war.

GEOLOGY OF YORKSHIRE—AN ILLUSTRATION OF THE EVOLUTION OF NORTHERN ENGLAND.*

THIS is a large, well-printed book of over a thousand pages, profusely illustrated, and should be in the hands of everybody interested in Yorkshire geology—student or teacher.

Many of the text-books of the past are very disappointing, and even misleading to Yorkshire students, because their



Craven Reef Knolls, from sketch by R. H. Tiddeman.

authors did not know, or did not appreciate, the great differences, both stratigraphical and palaeontological, between the Yorkshire formations and beds of similar age in the South of England.

This, however, is all put right in the work before us. The writers are practical geologists (as distinguished from the scissors-and-paste and arm-chair varieties), and know intimately the whole of the ground of which they speak, and

* By Percy F. Kendall, F.R.S., M.Sc., and Herbert E. Wroot.

have managed to tell their tale with a masterly lucidity, which, while satisfying to the advanced student, is not out of the reach of the elementary student and general reader. The illustrations are very good, and for the most part are *new*.

Another very pleasing feature of the work is the introduction of pictures of the pioneers of Yorkshire geology, and brief biographical sketches of them and their work.

Probably, to a beginner, the story of the Glaciation of Yorkshire is one of the most difficult to understand on account of the mass of detail available, often technical, relating to the subject. This part of the work is especially valuable from the simple and scholarly way in which the whole of the facts



Craven Reef Knolls, from a sketch by Sir Archibald Geikie.

are presented. It is also gratifying to find that the authors do not shrink from mildly censuring those whose slipshod work in the past has done much to confuse the issue of these problems.

The work itself is issued in two forms, perhaps the most convenient being that in two volumes, the first containing a general account of the Geology of the county, the second a description of twelve routes from a railway carriage window, and 117 'specimen-days' in Yorkshire. The price for the two volumes is 17/6 net, and they can be obtained from the authors, Prof. P. F. Kendall, Sandhill Lane, Moor Allerton, Leeds, or H. E. Wroot, 99 Spencer Place, Leeds.

As an example of the method of illustration we are permitted to reproduce three views of the Craven Reef-knolls from hitherto unpublished drawings.—J.W.S.

YORKSHIRE NATURALISTS'S UNION : VERTEBRATE ZOOLOGY SECTION.

E. WILFRED TAYLOR.

A MEETING of the Vertebrate Section of the Yorkshire Naturalists' Union was held in the Library of the Leeds Philosophical Society on Saturday, October 25th, Mr. C. F. Procter presiding. The Sectional Meeting was preceeded by a meeting of the Yorkshire Wild Birds and Eggs Protection Acts Committee, and of the Yorkshire Mammals, Amphibians, Reptiles and Fishes Committee. The minutes of the previous Sectional Meetings were read and approved. The only change among the Sectional Officers was the election of Mr. F. H. Edmondson as President of the Section.

Mr. Parkin described the discovery of a quantity of egg shells scattered around a grassy mound in Wharfedale, recorded in detail in the annual report of this section. He also referred to a white-breasted Cormorant, seen by him near Flamborough.

Mr. Chislett remarked that while he had seen many Cormorants with white breasts, they had never been associated with breeding colonies.

Mr. Edmondson exhibited a Robin's egg which had a double shell, the usual markings being present on the inside one.

Mr. Booth exhibited a photograph of a malformed cat, the original of which had attracted much attention in the Bradford district, where it was believed to be a new animal. It was ultimately so injured by the other cats that it had to be destroyed. He also described the rearing of a nestful of hawks, by a Russian naturalist, which resulted in individuals conforming to three supposed sub-species ! Full details were given at the British Ornithologists' Club.*

Mr. Rosse Butterfield exhibited the head of a Jackdaw with malformed mandibles, and also jaw-bones of a rabbit in which the incisor teeth had grown to a great length.

At the evening meeting a paper was read by Mr. R. Chislett on ' Bird Life on two Baltic Islands.' The lecturer was anxious to study and photograph some of the rarer birds on the British List and at the instigation of a Swedish naturalist, visited the Island of Öland, accompanied by Mr. J. Atkinson, who contributed many of the beautiful slides illustrating the paper.

About mid-way between Harwich and the Danish coast, a Whitethroat and several Tree Sparrows alighted on the steamer and stayed for the remainder of the sea journey. The destination was reached *via* Copenhagen, Malmo and Kalmar, and the inhabitants showed no little surprise at this English invasion ; a large and interested party accompanying them to the inn.

The island of Öland is about ninety miles long, but does not exceed ten in width ; it consists of juniper-covered rocky commons, extensive woodlands, marshes and cultivated areas. The Tawny Pipit was the first new species encountered, and quantities of flowering Cowslips and Meadow Saxifrage were noted before the marshes were reached. The swamps teemed with wild life, Lapwings and Black-headed Gulls being most abundant, but a few Common Gulls were also nesting. The Little Gull, which is believed to nest occasionally, was not seen. The greater part of the swamp was knee-deep in water, and even the grass-covered areas sank underfoot. The Redshank and Common Snipe were found nesting in the floating vegetation, but no nests of the Great Snipe were discovered, although the birds were seen. Black-tailed Godwits were conspicuous, resembling a double-pointed dart in flight, the pointed wings operating mid-way between the outstretched legs and neck. The

* These are referred to on p. 353 of *The Naturalist* for December.

eggs were just hatching, and a party of chicks was observed swimming with both parents circling round overhead. After hatching, the Godwits lead the young away from the swamps. Ruffs were seen, but as there was no regular fighting hill, and perhaps because the season was well advanced, sparring took place in a more casual manner. The Reeve makes a nest very similar to that of a Redshank, and the eggs found resembled those of a Snipe on a larger scale. Dunlin and Golden Plover were seen, and no doubt were nesting, but nests were not actually found, as in the case of the Ringed Plover. Nests of the Arctic and Black Tern were found, the latter selecting a bed of moss in the wettest part of the swamp, the slight weight of the bird being insufficient to bear down the floating vegetation. The back plumage of both birds was leaden grey, but the head and underparts of the cock were black, a white patch showing at the bend of the wing; the hen had a little black on the head and none on the underparts. Photographs were exhibited of both birds together at the nest, and showed clearly the differences between the sexes. They appeared to capture insects on the wing and to pick up something from the water while in flight, and the food brought by the cock to the sitting hen appeared on one occasion to be a shrimp. They were not observed to dive into the water like the Common Tern.

The photographing of the marsh birds was unusually difficult owing to the gradual subsidence of the tent and the photographer's stool into the marshy ground. The safe disposal of the photographic equipment inside the tent, and the question of suitably dealing with 'hordes of small creatures which swarmed up the photographer's legs and dug their heads into the flesh, had also to be overcome. Among the ducks the Pochard was seen, and photographs were obtained of the Shoveller and Tufted Duck. The Spotted Crake and Slavonian Grebe were also seen, and evidently nested in the swamp.,

On the drier parts of the island Blue-headed and White Wagtails were plentiful, these being the continental forms of the British Yellow and Pied Wagtails. Wheatears were perhaps the most numerous species on the island. On one occasion Swallows were observed hawking round the heels of cattle, evidently collecting the disturbed insects. Preferring the more active movements of the photographers, they attached themselves to the party, circling round at very close range, and following them into the midst of a wood.

Both Garden and Blackcap Warblers were plentiful in the woods, and a single nest of the Barred Warbler was found, and several of the Icterine Warbler. The last were very deep, and built of grass, twined horizontally and intertwined with vertical strips of Birch bark; they were in every case raided by Hooded Crows. Nearly every wood contained a pair of Thrush Nightingales, but no nest was found. The song is very powerful, and uttered with great deliberation and many pauses. Red Backed Shrikes frequented the edges of the woods. In the woods, Lilies of the Valley, Solomon's Seal and Herb Paris were abundant, and members of the Orchis family carpeted the ground, the Early Purple, Yellow, Military, Green Winged, Scented and Dwarf being noted.

While crossing to a second and smaller island, a few Velvet Scoters were seen, and just before landing a pair of Turnstones flew silently away along the coast. Near the landing place a Common Gull had nested on the roof of a wooden barn, while a White Wagtail was sitting near the roof, and a Velvet Scoter had nested in the midst of a heap of hay on the floor; other nests of the Velvet Scoter were found among the tall umbelliferous plants. Several colonies of Arctic Terns were observed, numbers of nests of the Common Gull and a single nest of the Scandinavian Lesser Black Backed Gull; the darker wing mantle of this type species being noted.

Several pairs of Redshank were nesting on the island, but the Turnstone was the main attraction, and eventually the birds were marked

down to a tall clump of flowering Chervil where the nest was found. The nest was merely a shallow scrape lined with a few grass stems and bits of seaweed, and a fine series of photographs was obtained at this, and at a second and more open nest found later in the midst of a colony of Arctic Terns.

In all thirty-eight species were proved to be nesting, and a further twenty-three species were seen and believed to be nesting, and no doubt this number could be considerably enlarged. The inhabitants were most helpful and courteous, and this, coupled with the ornithological attractions, rendered the visit a great success.

On the return journey in the North Sea, a Skylark and a bird believed to have been a Dusky Thrush alighted on board the vessel.

Mr. Booth called attention to the differences in plumage of the Lesser Black-backed Gull, and thought that the Farne Island birds were intermediate between the Scandinavian and Scilly Island birds, a view which Mr. Atkinson supported.

ENTOMOLOGICAL SECTION.

T. B. KITCHEN AND W. D. HINCKS.

THE Annual Meeting of this Section was held in the Leeds City Museum on Saturday, October 18th, 1924. Mr. C. A. Cheetham occupied the chair. The exhibits were as follows:—

COLEOPTERA.—By Mr. E. G. Bayford:—Several *Tetropium gabrieli* var. *crawshayi* Sharp, imported in larch plants into Barnsley. Two *Otiorrhynchus singularis* L. (*picipes*), one with a deciduous mandible.

Mr. Maxwell-Stuart:—*Anatis acellata* L. var. *bicolor* Weise, *Liopus nebulosus* L., *Phyllopertha horticola* L., all from Everingham.

Mr. M. L. Thompson:—*Agabus melanarius* Aub., and *Phyllodrepoidea crenata*, from Arncliffe Wood, Whitby, and *Aleochara ruficornis* Gr., from Robin Hood's Bay.

Mr. T. B. Kitchen:—Two ♂s *Stenochorus (Toxotus) meridianus* from near Leeds, showing the great variation in size of the specimens.

LEPIDOPTERA.—Mr. H. Maxwell-Stuart:—*Crocallis elinguaris* Linn. A fine series of *Cirrhoedia xerampelina* Hubn., with an example of the var. *unicolor*, from Everingham. Rev. C. D. Ash:—*Cidaria suffumata* var. *porriti*, also a few *Boarmia repandata* Linn. and *Abraxus grossulariata* from Saxton.

Mr. B. Morley:—A dark specimen of *Polia chi*, also long and variable series of *Bombyx quercus* Linn. var. *callunæ* Palmer, from the Penistone Moors, also living larvæ of this species.

Mr. T. Ashton Lofthouse:—*Coccyx nanana*, *Cedestis faranitella*, *Scardia arcella*, from Halnaby Carr; *Pædisca ratzeburghiana*, a species only once before recorded for Yorkshire, but since taken off spruce fir at Kildale. *Pamplusia mercuriana*, from Upper Teesdale, and a short series of *Peronea variegana* varieties, including some beautiful white forms from Linthorpe, Middlesbrough.

HEMIPTERA.—Mr. J. M. Brown:—Specimens to illustrate dimorphism in the Hemiptera. Macropterous and micropterous forms of *Nabis flavomarginatus*, *N. lativentris*, *N. limbatus*, *Delphax discolor* and *Dicranotropis hamata*. Sexual dimorphism shown by difference in structure, illustrated by *Mecomara ambulans*, *Globiceps dispar*, *Byrsoptera rufifrons* and *Heterocordylus genistæ*. Sexual dimorphism shown by difference in colour illustrated by: *Tettigonia viridis*, *Acocephala nervosus*, *A. bifasciatus*. Dimorphism limited to one sex illustrated by macropterous males and macro- and micropterous females of *Leptopterna ferrugata* and *L. dolabrata*. Dimorphism exhibited by both sexes illustrated by macro- and micropterous males and females of *Bryocoris pteridis*. Seasonal

dimorphism illustrated by *Miris calcaratus* and *M. holsatus*; also specimens of some less common Yorkshire Hemiptera and a series showing the common varieties of *Philaenus spumarius*.

HYMENOPTERA.—Mr. Rosse Butterfield exhibited *Nomada guttulata*, *Andrena cingulata*, *Salix fuscus* and *Myrmosa melanocephala*, all females. Mr. A. E. Bradley showed a series of the queens of the Mountain Bee, *Bombus lapponicus* Fabr. to illustrate the amount of variation which he had found in a hundred individuals captured over an area of several miles in the neighbourhood of Llanfairfechan, North Wales, in the middle of May. Sixty-five of the queens taken were of the common type; fifteen had segments 4 and 5 of the abdomen largely clothed with pale yellow hairs, so as to be distinctly 'yellow-tailed.' Seven had tufts of yellow hairs on segment 1 of the abdomen; eight had the yellow 'collar' darkened and nearly obsolete; and five were merely faded by exposure. Mr. Bradley mentioned that among forty or fifty of the 'worker' caste, taken a month later over the same ground, he could find no colour variation at all. Other humble bees from the same district were shewn; and from Roundhay, Leeds, a very small male of *Psithyrus distinctus* Pérez, which he thought might prove to be the wanted male of the recently discovered var. *rubrifipes* Perkins.

Mr. E. G. Bayford:—Larval skin of *Pterostichus madidus* (?) with pupæ of *Exallonyx ater* still in situ.

MYRIAPODA.—By Mr. M. L. Thompson:—A large *Julus* imported into Middlesbrough among bananas.

DIPTERA.—Mr. C. A. Cheetham exhibited two large boxes of the Yorkshire Tipulidæ and the allied genera, *Pedicia*, *Cylindrotoma* and *Phalacroceræ*. The box of Tipulidæ contained 37 of the 45 British species. He gave some instances where species were plentiful for a short time only, showing the need of constant visits to the same localities, and he also suggested that in the case of *Tipula stægeri* Nielson (= *signata* of our list) and *signata* Staeg. (= *marmorata*) that these might be dimorphic males of one species. Mr. W. D. Hincks exhibited a box of various Diptera taken during the season, including *Eristalis rubrum*, *Pipiza noctiluca* ♀, two specimens of *Sericomomyia borealis*, ♂ and ♀, *Conops flavipes*, *Sicus ferrugineus*, two specimens of *Myiatropa florea*, one being a dwarf ♀, *Atherix ibis*, a rather uncommon species from Collingham Bridge, *Pyrophæna rosarum*, *Xylata sylvarum* and several other interesting flies.

NEUROPTERA.—Mr. J. M. Brown:—*Panonpa* sp. from Wharncliffe.

TRICHOPTERA.—Rev. C. D. Ash:—Species from near Selby.

ARACHNIDA.—Mr. W. P. Winter:—A retreat of a Western Australian trap-door spider, showing the trap door and an 8-inch tube descending from it.

The evening meeting was devoted to the election of officers and the reading of the various reports.

Mr. G. T. Porritt was unanimously re-elected President. Mr. B. Morley, the Sectional Secretary, said that, owing to ill-health, he must resign. Mr. E. G. Bayford proposed, and Mr. Ashton Lofthouse seconded, a vote of thanks to Mr. Morley for the splendid work he had done for the section during his fifteen years as its secretary.

Messrs. T. B. Kitchen and W. D. Hincks were elected joint secretaries.

The various reports were next dealt with, and showed that considerable additions to the county lists had been made, the most numerous being in the Hemiptera and Diptera. In the former group, Mr. Brown reported the addition of thirty species, making a total of ninety species added since the County Lists of Hemiptera published by Dr. Fordham in 1921.

The report on Diptera showed that many interesting captures had been made, including *Prionocera turica* from Austwick, Helwith and Skipwith, *Ptychoptera paludosa*, *Ctenophora pectinicornis* and *Xylophagus*

ater from Thorner. *Pachyrinus lunulicornis*, *P. analis*, *Chrysonotus bipunctatus* and *Gymnochaeta viridis* from Rawdon, *Pachyrrhina quistfalica* from Wistow.

Special attention had been given to the Tipulidæ. Some previously little-known species have been found to be very widely distributed.

It was decided that one of the sectional meetings next year should be held in some locality in the York district a fortnight after Whitsuntide.

SOUTH-WEST YORKSHIRE ENTOMOLOGY.

By the kind invitation of Mr. W. Buckley, the members of the South-West Yorkshire Entomological Society held a pleasant meeting at his house, Commercial Road, Skelmanthorpe, on November 22nd. The following members passed cases of lepidoptera round for inspection:

Mr. J. Hooper: Geometrid species taken at Scarborough during July, and *Urania leilus* and *U. riphæus* from Peru and Madagascar respectively.

Mr. T. H. Fisher: a long series of *Abraxas grossulariata*, including var. *nigrosparata* and others near var. *lacticolor*, bred this year, from Clayton West.

Mr. E. Cocker: a series each of *Bombyx quercus* from Askern and *B. callunæ* from Penistone Moors.

Mr. G. T. Porritt: *Zeuzera pyrina* from near Huddersfield this year; *Selenia lunaria* and its var. *deluna* from Teesdale, and *Spilosoma lubricipeda*, spotless with the exception of a small spot near the base of the costa. Mr. Fisher took a specimen of this form near Wakefield about twelve years ago.

Mr. B. Morley: two drawers showing the variation in *Selenia lunaria* and *Bombyx callunæ*, taken locally, and a number of Tortrices, etc., taken at Folkestone in July.

After tea Mr. Buckley showed his collection. As was to be expected, the local melanic tendency was much in evidence in many species. There were two striking insects, a pale, lemon-coloured *Euchloë cardamines* and an almost black *Agriopsis aprilina*. Many other good things were noticed.

Mr. B. Morley gave a review of a week's collecting at Folkestone in July last, referring especially to the rather disagreeable experience of collecting *Tapinostola bondii* in the centre of the town.

A vote of thanks to Mr. Buckley brought an enjoyable meeting to a close.—B. MORLEY.

COMMITTEE OF SUGGESTIONS.

RIVER INVESTIGATION.

A MEETING was held in the Leeds University on November 13th, Prof. Priestley being in the chair.

The sub-committee appointed at the previous meeting considered that the original suggestion to have four stations for monthly visits and collections could not be carried out, Beckermunds being very difficult of access.

The meeting agreed to reduce the stations for monthly collecting to two, viz., Grassington and Harewood, and it was considered desirable that Beckermunds, Ilkley and Ulleskelf should be visited at least twice yearly.

Mr. J. W. H. Johnson reported that Dr. McLean Wilson did not expect to have the new laboratories ready to deal with the water analysis until towards the end of 1925.

The Leeds Philosophical Society have interested themselves in our work, and have made a grant towards the expenses. This is to be devoted to work on the River Aire, and they hope to assist in the publication of the results of the work.—CHRIS. A. CHEETHAM.

CORRESPONDENCE.

THE MAY-LILY IN YORKSHIRE, Etc.

The following correspondence, which has recently appeared in *The Times*, will interest our readers :—

Many years ago, when at Ken Wood, I asked the late Lord Mansfield if the May-lily (*Maianthemum bifolium*) was still to be found in his woods. He said he had never heard of the plant, but suggested that his gardeners might know something about it. One of the older men was called. At first he did not appear to recognize the plant, but when I described it he thought he knew what I meant. He took me to a clearing in the wood, where I saw quite a quantity of the little plant spread over several square yards. This plant is extremely rare in this country, and only occurs in a few isolated places, chiefly in the North of England. It is rather remarkable that two of the rarest specimens of British fauna and flora, represented by the badger and the May-lily respectively, should occur in a wild state within the County of London. Very special precautions should be taken to safeguard this plant.—MR. J. E. SAUL, Black Warren, Radlett, Herts.

I found the May-lily in the county of Durham several years ago. It had spread itself over about a quarter of an acre of ground in a wood. I made known the finding of it to the then secretary of the museum of Newcastle-on-Tyne, Mr. House, and asked him not to publish its whereabouts. A few years later Professor Oliver was spending some days in the neighbourhood and also found it, much to his delight, but on also communicating with Mr. House, he had to admit that it had been already discovered.—REV. J. C. DUNN, Torbryan Rectory, S. Devon.

Yorkshire botanists will have read with interest the two letters from Mr. Saul and Mr. Dunn, reporting colonies of the rare plant, the May-lily, at Ken Wood and in Durham County. We have hitherto regarded our colony near Hackness as the largest British example. Of this, Baker, in his 'North Yorkshire Flora,' published in 1906, says it was originally discovered in 1857, and he describes this as the only British station where the plant is clearly indigenous. Here it was said in 1906 to cover a space 90 yards in length; and in recent years it has spread. Speaking of Ken Wood, Sowerby gives his opinion that this colony has every appearance of having been artificially planted. We should be glad if other British colonies of this rare plant might be recorded in your columns.—MR. REGINALD H. BARKER, May Lodge, Scarborough.

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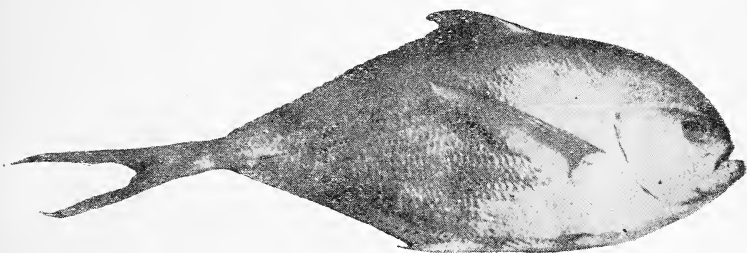
The Story of British Annelids, by **Hilderic Friend**. London : The Epworth Press, 288 pp., 7s. 6d. net. A year ago we referred in these columns (*The Naturalist*, January, 1923, p. 1) to a small work by Hilderic Friend on 'British Earthworms and How to Identify Them,' and we reproduced a coloured plate showing some of the principal species. Within a year a much more substantial work appears, under the above heading, which has the same coloured plate as the frontispiece. The writer modestly tells us that the book is produced because he has something to say, 'and he alone can say it.' In this work 'fifty species are described, the bulk of which belong to the Lumbricidæ. The waterworms and potworms were entirely excluded, as their number is so great as to necessitate separate treatment,' and the author informs us that 'It now remains to give a tabular statement setting forth, approximately, the number of Oligochaets at present known to exist in Great Britain, including in this England, Scotland, Wales, the Isle of Man and Ireland. As a few of the genera are undergoing revision the list does not claim to be more than an approximation to the true number.' The author deals with Heads and Tails; Enemies of Worms; Wonderful Egg; Why do Worms Die? Some Popular Names of Worms, etc.

FIELD NOTES.

Large Pike in E. Yorks.—A remarkably fine pike, weighing 24 pounds, was recently secured in the pond at Burton Constable by M. C. T. Niven, of Hornsea, who has kindly sent the specimen to the Hull Museum for preservation.—T.S.

Porbeagle at Whitby.—A large Porbeagle was captured on a hand-line off Robin Hood's Bay by Mr. M. Leadley, of the motor fishing-boat 'Remembrance' on October 11th, and landed at Whitby, where it was exhibited. The length was 9 feet 6 inches, and the estimated weight about 5 cwts.—F. SNOWDON.

Ray's Bream at Bridlington.—A fine example of this fish has just been sent to the Museum at Hull by Mr. W. M. Ash, of Bridlington, on the suggestion of Mr. R. J. Flintoff. It was washed ashore alive on the South Sands towards the end of



November. The species is by no means common, especially in these parts, and oddly enough its first record was made in Yorkshire. According to Couch, 'This fish was first made known to science by Ray, who obtained a figure and description from his friend, D. J. Johnson, of an example which had been left by the tide at the mouth of the Tees, in Yorkshire. This was in the month of September, 1681, and although since that time many specimens have come into the hands of naturalists, it is worthy of notice that a large proportion of them have only been met with dead on the shore after a storm, or ready to expire, as if they had been exposed to some uncongenial influence of weather or temperature after having wandered from a depth or district which was better fitted to their natural habits. One, however, that came into my possession was taken with a hook by a Cornish fisherman; and a remark of Risso implies that it is also caught with some regularity in the Mediterranean in May, June and December. The comparative rarity of its capture, and the circumstances usually attending it, seem to imply that its more usual resort is in

the deeper portions of the sea, where the temperature is colder, or at least more equable than in shallower water; which circumstance may help to explain how it happens that it has been found within an extensive range of apparently opposite situations.' The Bridlington specimen measures 2 ft. 2 ins. in length, $10\frac{1}{2}$ ins. across the widest part, and weighs $6\frac{3}{4}$ lbs.—T. SHEPPARD.

Late Corncrake near Bridlington.—I am sending you a Corncrake which was killed on the 13th November during a partridge drive near Fraisthorpe, on the Boynton Estate, by a beater hitting it with a stick. It is an unusually late date for the Landrail to be found in this district. The bird is in good condition and apparently perfectly healthy.—R. J. FLINTOFF.

Bean Goose, etc., in East Yorks.—A Bean Goose was shot at Stone Creek, on the Humber Bank, on December 6th. It was one of a small lot of six. It is the first time I have ever seen a real Bean Goose on the Humber, although it has been recorded at least a dozen times. In every case where authentic investigation could be carried out, it turned out to be the Pink-footed. On November 22nd, three House Martins were seen at Cherry Cob Sands on the Humber side.—CHAS. F. PROCTER.

Peregrine Falcon, etc., in Holderness.—A pair of Peregrines was observed during the week ending November 1st, 1924, ranging the Humber Estuary from Stone Creek to Paull. The female was observed to strike and kill a Curlew (with the Tiercel in attendance) and later a Partridge. It is probable that these may be migrants, as a large number of waders, Fieldfares and Redwings, Woodcock and Gold-crested Wrens had come over during the favourable conditions of the week. I was at Spurn on Sunday morning, October 26th. A Gold-crested Wren had esconced itself in the window of the Blue Bell Inn at Kilnsea. Considerable numbers of Hooded Crows have come over this time.—CHAS. F. PROCTER.

Bird Notes from Whitby.—On July 30th, an adult Little Gull was observed in the harbour at Whitby, which it frequented until October 12th. When first noticed it was in almost full summer plumage, and the gradual change into winter garb was interesting to watch. About high tide it was generally to be found associating with the Black-headed Gulls in the outer harbour, and it soon acquired their habit of picking up the bait which falls from the lines of anglers fishing from the pier extensions. Mr. James Patterson, of Wheeldale Lodge, Goathland, found a Little Owl in a shooting-house on Wheeldale Moor on August 21st. It had been dead a short time, and had probably found its way into the building by

going down the chimney. The bird was an adult female, deep in the moult. Mr. Patterson found ejected pellets which contained the remains of insects. A Hooded Crow was observed near New Gardens, Whitby, on Sept. 4th. The first Purple Sandpiper of the season was noticed on Oct. 21st. A Wheatear in female dress was observed on the cliffs near Whitby on Oct. 30th. It appeared to have some injury, which probably accounted for its late stay.—F. SNOWDON.

Cumberland Coleoptera.—The localities in the Cumberland List for the rare *Aleochara ruficornis* are all in the eastern part of the county, but one was taken near Bowness-on-Solway last June. *Subcoccinella 24-punctata* is quite common in the Wigton district, and restricted to no particular plant. I have also taken it in a lane near Drigg station, and a single specimen in flood refuse on the Eden near Carlisle. *Allo-dactylus affinis* has long been known from the Gelt Woods. I have also taken it freely along the base of the Roman Wall near Burdoswald, between Alston and Leadgate, and between Caldbeck and Hesketh-Newmarket. This seems to agree with the distribution in the county of *Geranium sylvaticum*, its host plant. Fowler (*Brit. Col.*, V., p. 339) says it is commoner near the coast than inland, but with us this seems to be reversed.—JAS. MURRAY, Kelsick, Wigton.

Mollusca near Sheffield.—The woods in the vicinity of Sheffield visited on the occasion of the Fungus Foray, being principally of Millstone Grit, with a layer of Peat, proved almost devoid of molluscan life, although the copious rainfall would be favourable for the observation of terrestrial species if present. The following is a list of all the species collected. A few of the commoner slugs were observed. Tyzack's pond yielded only three aquatic kinds, included in the following list, ascertained by John W. Taylor, Esq.:—*Limnaea peregra*, *Sphaerium corneum*, *Planorbis albus*, *Euconulus fulvus*, *Hygromia striolata*, *H. hispida*, *Zua lubrica*.—GREEVZ FYSHER.

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The Wonderful Weald, by Arthur Beckett. London: Methuen & Co., xv.+302 pp., 8/6. This fascinating story, with its wealth of information relating to the folk-lore, topography, antiquities, natural history, and all that appeals to the lovers of the Downs, has now reached its third edition. The volume has been revised, and is now issued by Messrs. Methuen. The numerous illustrations from photographs are all that can be desired.

The Natural History of Selborne, by Gilbert White; edited by Richard Kearton. London: J. W. Arrowsmith, Ltd, 248 pp., 21s. net. This work is evergreen, and has appeared under an enormous number of guises. Here Mr. Kearton has drawn together nearly a hundred photographs, principally taken in Selborne, by means of which he illustrates Gilbert White's well-known work. Mr. Kearton's photographs are principally of bird life, though occasionally a reptile, mammal or landscape appears.

YORKSHIRE NATURALISTS' UNION REPORT.

*(Continued from page 27).*MAMMALS, AMPHIBIANS, REPTILES AND
FISHES COMMITTEE.

Mammals (Sydney H. Smith).—The usual common species of mammals maintain their position in the county, except the Red Squirrel, which is gradually disappearing before the advance of the American introduced species, assisted, no doubt, by foresters, who generally shoot both on sight. The English species was once common at Sandburn, near York, but is now rarely seen, in spite of the efforts of the owner (Mr. John Hetherton) to extend protection.

Mr. H. B. Booth reports that on March 30th he watched a female Stoat at Ben Rhydding. It was in full winter pelage of yellowish white, and he remarks on the late date for this animal not to shew signs of resuming its usual brown summer coat.

Mr. W. J. Clarke records a Whiskered Bat as having been taken at Scarborough Mere on May 28th, and that two seals were seen in Cayton Bay, south of Scarborough on May 28th, and another in the Scarborough South Bay on October 5th. A seal noticed in the North Bay on October 19th may have been the same individual. All were of the usual common grey species.

An albino common (or brown) Rat was trapped at Embsay, near Skipton, during September, and reported by Mr. Rosse Butterfield.

Mr. C. F. Procter adds :—The Fox appears to be increasing in numbers—a case coming under the writer's notice where fourteen were found dead round one village, presumably to poisoned baits. Litters of seven, eight and nine have been several times recorded this last spring. This number is in excess of the generally expected average. Rodents generally do not appear to have been more than ordinarily aggressive this year. The Brown Squirrel has now disappeared out of Holderness, but one was caught within the borough boundaries of Hull in April, 1924. It may have been an escapee.

Pisces.—A large Gudgeon, weighing $2\frac{1}{2}$ ozs., was caught by Mr. F. Parker on the Yorkshire side of the River Tees, at Middleton-on-Row, on October 27th, 1923.

A Roach weighing 2 lbs. $\frac{1}{4}$ oz. was caught in the River Ouse at Ouse Bridge, York, by Mr. J. W. Burley, on July 31st, 1924.

A Dace weighing $12\frac{1}{2}$ ozs. was caught in the River Derwent at Low Catton by Mr. F. Lowther on October 12th, 1924.

A reputed Dace of $14\frac{1}{2}$ ozs., caught in the River Ouse on October 13th, which had all the characteristic appearance of the Dace, was ultimately identified as a poor-conditioned Chub. Several Barbel, varying in weight from 7 to 8 lbs., have been taken in the River Ouse at Poppleton.

Two Bream caught in the River Derwent at Wheldrake by Mr. W. Andrews, of York, turned the scale at 11 lbs. the pair.

A large Trout caught on a spinner in the River Ouse near Poppleton Bridge weighed 5 lbs. 5 ozs.

A Trout caught in the Derwent at Forge Valley on July 3rd, 1924, and examined by Mr. W. J. Clarke, had its stomach crammed with a mass of seeds of Dog's Mercury. This is a most unusual food for a trout, or, in fact, for any freshwater fish.

Mr. W. J. Clarke records the following captures on the Yorkshire East Coast :—

A Great Weaver, 12 inches long, was trawled near Scarborough on January 14th.

A Sturgeon, weighing 8 stones, was landed by a trawler on February 6th, and was sold for £5 16s. Another was brought into Scarborough on April 15th, measured 8 feet in length, weighed 16 stones, and sold for £19.

A Skate, 6 feet wide, 7 feet long, and weighing 12 stones, was landed at Scarborough on October 7th.

Reptilia.—A Grass Snake captured at the Sewerage Farm at Frizinghall, Bradford, on September 29th, and the first seen here for about fifteen years, was examined by Mr. H. B. Booth. It was very dark in colour, and appeared to lack the distinguishing light ring of the grass snake. It was ultimately decided that it was the Continental form, and probably an escape from some vivarium.

WILD BIRDS AND EGGS PROTECTION COMMITTEE.

Mr. F. H. Edmondson reports :—

The Breeding Season, 1924, has not been very satisfactory, but shows an improvement on 1923. Fulmar Petrel on Bempton Cliffs have increased.

The Peregrine Falcon in North-west Yorkshire.—Reports are unsatisfactory. I think one pair reared its young, although the pair we specially protect has not succeeded in doing so. Three different lots of bird-nesters tried to get the eggs, but I do not think successfully. Is it possible that the birds were kept off the eggs so long as to spoil them? The old birds were seen about the cliffs right into July.

Stone Curlew, North Riding.—Two pairs are reported having been seen about the usual ground. Three or four pairs have bred on the North, young ones having been seen.

The Stone Curlew in the East Riding has disappeared.

Hornsea Mere.—The expense for Hornsea Mere has been the same as last year. I heard from the keeper at the beginning of the season that the usual birds had arrived and were nesting, and things looked satisfactory with twelve pairs of Great Crested Grebe breeding, Tufted Ducks more numerous than in 1923, but many non-breeding birds.

Spurn.—I am pleased to report a decided improvement. Lesser Tern arrived April 30th, in good numbers, and had eggs, May 19th. The first Ring Plovers' eggs were marked May 12th, which is a late date. Numbers were fewer than in 1921 and 1922. On June 10th, twenty Tern nests were destroyed by the sea. Crows and Magpies have been a very serious problem this year; they are reported breeding at Skeffling, and have repeatedly raided the Tern's nests, many of the raiders have been destroyed. Redshank were more numerous in the Marshes, and Green Plover more common this year than for many years.

Fulmar Petrel.—Protection was given to both the bird and its eggs by the County Council on our recommendation. The Fulmar Petrel bred at Speeton in considerable numbers. Although I have reason to believe that the climbers are taking a few eggs, they certainly left a large number to hatch, and if the increase continues we may be able to take away the protection we got for the birds, and still have them as a regular breeding species. I think this question will have to come up after next season, and would like other members to visit the cliffs during the coming season with this in their minds, so that we may come to a proper conclusion.

Green Plover in the North and West Ridings.—We have a fair increase of breeding birds, although the year has been bad.

Merlin in the West Riding.—On the Duke of Devonshire's Estate two or three pairs have reared their young. On the borders of Lancashire and Yorkshire the report is satisfactory, although the keepers and grouse shooters are complaining, which may be expected after the bad season.

I wish again to draw attention to the Balance Sheet. Surely we should manage to raise more than thirty subscribers among our members, It is not for large subscriptions we are asking, although they are certainly welcome.

BALANCE SHEET.

RECEIPTS.		£	s.	d.					
Balance brought forward		0	8	5	Mr. W. Taylor	...	0	7	6
Mr. Albert Hirst	...	5	0	0	Mr. G. Fysher	...	0	5	0
Mr. W. H. St. Quintin	...	5	0	0	DONATIONS.				
Major J. W. Dent	...	2	2	0	Collected by Mr. F. H. Edmondson	...	1	15	0
Mr. L. Gaunt	...	2	2	0	Children's Lecture, Sunday School (per Mr. Edmondson)	...	0	18	2
Miss Waterhouse	...	1	1	0	Bradford Naturalists (per Mr. W. H. Parkin)	...	0	12	0
Mrs. Bishop	...	1	1	0	Keighley Naturalists	...	0	13	1
Mr. Johnson Wilkinson	...	1	1	0	Ross St. Baptist Church (Young People's Guild)	...	0	16	6
Mr. F. B. Smith	...	1	1	0	Rev. J. H. Warner, per Mr. W. H. Parkin	...	0	10	6
Mr. O. F. Saner	...	1	1	0	Mr. J. D. Mather	...	1	6	9
Mr. J. Atkinson	...	1	1	0	Shipley Conservative Club	...	1	12	6
Mr. H. B. Booth	...	1	1	0	Collected by Mr. Procter	...	1	0	0
Mrs. Dibb	...	1	0	0	Bank Interest to June 30	...	0	4	0
Mr. and Mrs. R. H. Edmondson	...	1	0	0	Balance due to Bank	...	0	3	1
Mr. B. Lipscomb	...	1	0	0					
Mr. F. H. Edmondson	...	1	0	0					
Capt. C. Scott-Hopkins	...	1	0	0					
Mr. W. H. Parkin	...	0	10	6					
Mr. W. G. Bramley	...	0	10	6					
Mr. E. B. Gibson	...	0	10	6					
Mr. S. H. Smith	...	0	10	6					
Mr. A. H. Lumby	...	0	10	6					
Mr. J. F. Musham	...	0	10	6					
Mr. W. N. Cheesman	...	0	10	6					
Mr. J. Y. Granger	...	0	10	6					
Mr. G. T. Porritt	...	0	10	0					
Mr. H. J. Behrens	...	0	10	0					
Mr. R. Chislett	...	0	10	0					
Mr. E. Cockshaw	...	0	10	0					
Mr. C. F. Proctor	...	0	10	0					
Mrs. Binns	...	0	10	0					

the slugs and snails were thrown into the water, devoured them readily, no evidence being given that the conspicuousness of *A. ater* was in this case protective; so that what was observed both at Heslingden and at Grange seems to point to the probability of ducks being useful in keeping down *L. truncatula*.

ENTOMOLOGICAL SECTION.

Coleoptera (M. L. Thompson):—The past season seems to have been a very unfavourable one for Coleoptera, and very few notes on Yorkshire beetles have reached me. Two additions have, however, been made to the county list. A single specimen of *Deliphrum crenatum* Grav. taken in Arncliffe Wood, Glaisdale, in September, is the most southern record for this Scotch insect up to the present time. The other addition was made by Mr. E. G. Bayford, who took an example of *Sphaerosoma piliferum* Müll. in June at Wharnccliffe. The interesting Longicorn, *Tetro-pium gabrieli* Weise. var. *Crawshayi* Shp., was also obtained by Mr. Bayford in some numbers from larch planks in June imported into Barnsley from near Oxford. The re-discovery at Glaisdale in September of the rare water-beetle, *Agabus melanarius* Aub. is also of considerable interest. It is hoped that further records of work done in the county will be forthcoming before the end of the year, so that a further report may be published in *The Naturalist*.

Hymenoptera (Rosse Butterfield):—It has not been a good season for the Hymenoptera, especially the Aculeata.

Mr. A. E. Bradley continued his investigations of the Social Bees. In June, near Levisham, I obtained an example of *Salix fuscus*, this being an addition. Special mention should be made of the interesting addition, *Methoca ichneumonides*, found last year on Allerthorpe Common by Mr. W. J. Fordham.

Mr. E. G. Bayford has bred *Exallonyx ater*, Nees (*Proctotrypidæ*) from a Coleopterous larva.

Diptera (C. A. Cheetham):—This year the sun-loving species have been scarce (especially Syrphids), except those with aquatic larvæ; on the other hand Gnats, Mosquitoes, Hilara and Tipulids have appeared in fair numbers.

The most important event has been the presence of Mr. Percy H. Grimshaw at some of the excursions, and the general stimulation of work due to the election of a dipterist as President of the Union. Another helpful visit was that of Mr. F. W. Edwards in June, and a number of additions to our list are due to him; he has described two species taken on this occasion in *The Entomologist's Monthly Magazine*, pp. 82 and 206.

Among the interesting captures not in the list of additions for the year are *Prionocera turcica* Fab. (*Diana* Mg.) from Skipwith, Austwick and Helwith; *Ptychoptera paludosa* Mg., *Ctenophora pectinicornis* L. and *Xylophagus ater* F. from Thorner; *Pachyrrhina analis* Schum., *P. lunulicornis* Schum., *Chrysonotus bipunctatus* Scop., and *Gymnochæta viridis* Fln., from Rawdon Crag Wood; *Pachyrrhina guesfalica* Westh. from Wistow and Bubwith.

Special attention has been given to the Tipulas, many species are added to the list, and some previously little known species are found to be widely distributed. *Tipula alpium* Bergr. occurs in plenty on our hills and also around Leeds (Rawdon, Farnley, Adel); it is more or less in evidence throughout the season; others have a very restricted season, like *stageri* Nielsen (*signata* nec Staeg.), *signata* Staeg. (*anonyma* Bergr.), which do not appear until the end of September, and this applies to *melanoceros* Schum., *luteipennis* Mg. and *pagana* Mg. These five species have been abundant this autumn at Austwick, the first two in a small wood, the last three on the Moss. *T. scripta* Mg., *unca* Wied. (*longicornis* Schum.) and *lunata* L. (*ochracea* aut.) in woods; *T. oleracea* L., in

meadows; *T. luna* Westh. (*lunata* aut. nec L.) in marshy places have all been seen in plenty; also *T. variicornis* Schum. (*annulicornis* Mg.), both in woods and on the limestone pavement of Oxenber, where they were much smaller in size than usual.

Lepidoptera (B. Morley):—Only two species of butterflies have been common in the Skelmanthorpe district, namely, *Lycaena icarus*, which appeared during the short warm period in mid-July, and the second brood of *Polyommatus phlæas* during the autumn. In the same district all the four common *Vannessids* were seen in small numbers. The Rev. C. D. Ash reports *atalanta* as common at Saxton, and Mr. T. Ashton Lofthouse saw the species common at Middlesbro'. Sugar seems to have been practically a failure, nor has larva beating been a success. Mr. Ash tried this method of collecting at Skipwith, Everingham and Allertorpe Common with poor results, so poor, indeed, at the last place that several hours work did not produce a single larva from either oak, birch or willow. He did, however, find *Eupithecia* more plentiful on *Angelica* than in recent years, both *oblongata* and *albipunctata*, and in the Huddersfield district Mr. Porritt found *E. linariata* on toadflax, and *E. pulchellata* on foxglove, where he had not seen either species for many years.

Abraxas grossulariata larvæ have been numerous again, after several years of scarcity, apparently throughout the West Riding. Mr. Porritt bred some good varieties from Huddersfield, and Mr. T. H. Fisher bred var. *nigro-sparsata* from Clayton West. Mr. Ash reared many hundreds of Saxton larvæ, but they, like a few hundreds from Skelmanthorpe, bred by myself, produced only ordinary forms. Mr. Ash points out that not a single parasite, either dipterous or hymenopterous, was bred from his lot, and this was my own experience, and also that of Mr. Porritt. This is very unusual. Mr. Porritt had a female *Zeuzera aesculi* brought to him alive, found at Whitley Lower on July 24th, Mr. Herbert Spencer obtained a specimen of the same species at Elland, and Mr. Bayford had three specimens brought him at Barnsley. *Polia chi* has again been common, but while about half of the Huddersfield specimens were var. *olivacea*, at Skelmanthorpe, that form was not at all common, although I did have the good fortune to find an almost black specimen.

Polia flavocincta, which used to abound at Huddersfield, has not been seen there for some years.

Mr. Porritt is of the opinion that Lindley Moor is the only moor near Huddersfield where *Saturnia carpini* can now be relied on, and where he saw it in the spring, but it is still a common species on all the moors and heaths near Penistone. I saw it flying freely on Royd Moor in early June, and the cocoons have been seen commonly in other places recently.

Mr. Fisher also received *A. atropos* from Clayton West in September.

In *The Naturalist* for October, Mr. Edward Gibson recorded the capture of *Acherontia atropos*, near Todmorden, on July 3rd, and in the same number Mr. E. P. Butterfield reports *Hypolepia sequella* from Bingley Wood. Mr. Ash took a specimen of *Cidaria suffumata* var. *porrittii* in his garden at Saxton in spring, quite a new part of the county for it.

In the Skelmanthorpe district *Cnephasia politana* appeared in great numbers on ling in early June, as also did *Lampronia rubiella* on raspberry, whereas previously there was only one record of the latter, but it is abundant enough in the Huddersfield gardens.

In mid-June, *Stigmonota coniferana* was very common in pines in Deffer Wood. Another species which appeared in extraordinary numbers was *Peronea aspersana* during August, flying about tormenting in pastures. It was observed that this species, along with the common *Crambus culmellus*, was frequently preyed upon by wasps. They were apparently always captured when flying. The wasps flew about as though searching for prey, until they came within about nine inches of the moths, at which they then flew and struck. The wasps did not mutilate their victims,

but flew away with them whole. On August 11th, *Nemophila noctuella* was taken, as also was *Ochsenheimeria bisontella* on August 2nd, both species had previously been taken in the district by Mr. Fisher, but not recorded. I have taken the following species in the district, none of which has been previously recorded:—*Emmelesia affinitata*, from Red Campion, and *Glyphipteryx fischeriella*, from cocksfoot grass, both on June 9th; *Retinia pinivora*, from pines, Deffer Wood, June 25th; *Lithocolletis corylifoliella*, from hawthorn, June 27th; *Gelechia domestica*, from mossy tree trunks, August 2nd; *G. mulinella*, plentifully from broom, August 3rd; *Tinea granella*, taken near a farm at Wind Mill, Skelmanthorpe, on August 9th. This species does not seem to have been recorded previously for the West Riding.

Neuroptera and Trichoptera (G. T. Porritt): The Rev. C. D. Ash sent me *Chrysopa phyllochroma* from Saxton, a new locality for this somewhat rare species in Yorkshire; and the only Trichopteron I saw of any interest was *Asynarchus cænosus* on Royd Edge Moor, Meltham. I had not seen it for many years, but it was formerly very common, and probably still is so, on the Marsden and Dunford Bridge Moors.

Microbiology (E. Percival):—A meeting was held on June 28th, 1924, at the Headingley Filter Beds of the Leeds Corporation Waterworks. Through the kindness of the Waterworks Engineer, it was possible for two nettings to be made of the various reservoirs and for the examination of the residue after the water had been drawn from a bed.

The water is received from Eccup reservoir, which is fed by the large tracts of water in Washburn Valley. The fauna was not very varied, but proved of interest.

The plankton animals consisted mainly of Entomostraca, viz., *Bosmina longirostris* O. F. Müller, *Diaptomus gracilis* O. Sars.

Also were present numerous pupal skins of an insect (probably a *Ceratopogon*).

In the mud were two Cladocera, *Eumycercus lamellatus* O. F. Müller, *Camptocercus rectirostris* Schoedler.

A collection made at the inlet of one of the beds included *Spongilla lacustris* L., *Limnæa peregra* O.F.M., *Gammarus pulex* L. Associated with the sponge was the polyzoan, *Paludicella Ehrenbergi* Bened. This was also found on Caddis-worm cases.

Triclad turbellaria were represented by *Dendrocolum lacteum* Müller, *Planaria polychroa* O. Schum.

The Trichopterous larvæ were: *Neuriclepsis bimaculata* L., and another unidentified Polycentropid, *Lype phæopa* Steph., *Limnophilus lunatus* Curt., *Leptocerus cinereus* Curt., *Mystacides azurea* L., *Molanna angustata* Curt.

(To be continued).

—: o :—

A well-illustrated account of 'The Grassholm Gannets in 1924—a Great Increase,' by Clemence M. Acland and H. M. Salmon, occurs in *British Birds* for December.

We learn from the *Transactions of the Woolhope Naturalists' Field Club*, with regard to Barytes, that 'it is because of its weight and whiteness useful in adulterating white lead and also flour'!

The *Proceedings and Reports of the Belfast Natural History and Philosophical Society*, 1922-3 have recently been issued (100 pp., 5s.). There is a Report on the People of Rachrai; an excellent and scholarly account of the Map of Ireland, by M. C. Andrews, and a well-illustrated Report on the Work at Nendrum, by H. C. Lawlor. Mr. J. G. Rhynehart contributes 'The Larva and Pupa of *Trichocera regulationis* L.' In the text the trivial name commences, quite correctly, with a small letter, though in the headings the name consistently appears with a capital letter; possibly not the author's fault.

REVIEWS AND BOOK NOTICES.

The Handbook of British Mosses, by H. N. Dixon, M.A., F.L.S., with Illustrations and Keys to the Genera and Species by H. G. Jameson, M.A. Third Edition, pp. xlviii.+582, 63 plates, 24/-; in two volumes, 28/-. 1924: London: Wheldon and Wesley, Ltd. The position this book occupies among students of British mosses is due partly to its outstanding merits, and partly to the position Mr. Dixon holds as an acknowledged leader in field work; as a referee of the British Bryological Society and its predecessor, the Moss Exchange Club, he has for more than a quarter of a century been in personal touch with bryologists, their work and their difficulties. A reviewer, writing of the second edition in *The Naturalist*, 1904, suggested that the book should be in every interested person's hands; it would be superfluous to repeat that, for it is probable that the only serious workers who do not possess it are those who have been prevented by failure of supply, even second-hand copies having been difficult to procure. The new edition has been brought up to date by inclusion of the essential details of many papers that have appeared in botanical literature during the past twenty years; a note on *Trichostomum crispulum* var. *brevifolium*, p. 238, is an example of the critical work that has been in progress; the Keys to Genera and Species, which have always been an attractive feature, have been strengthened; the nomenclature of the second edition has, with certain modifications, been retained. The most noticeable improvement is in the illustrations; the plates have been entirely redrawn by Mr. Jameson, and reproduced by photography. It can hardly be said that they serve their purpose better, for the old line drawings were a success, but the appearance of the volume is greatly enhanced; the bulk and weight of the plates have been reduced by half by using both sides of the paper; space has been found for much new detail by rearrangement, and some slight reductions in magnification; for instance, the nine capsules of *Brya* sketched in the previous edition have been increased to twenty-nine. It will be noticed that the Latin diphthong and the German umlaut mark have been abandoned. Five species, sub-species and varieties have been expunged, a dozen have been added, an extra page, xviii.-xx, has been given to Instructions in Practical Examination and Measurement, and many new notes are scattered throughout the text without increasing the size of the volume; this has been achieved at some cost to appearance and comfort by reduced spacing, and some slight changes of type. The price does not seem to have been increased to the extent of altered money values. Some alterations have been made in accordance with more recent opinions. *Sphagnum tenellum* has been removed from the Subsecunda section to Cuspidata and the Acutifolia section has been further split into Squarrosa, Acutifolia and Cuspidata. *Sphagnum Russowii* Warnst. has been placed as a var. of *S. Girgensohnii*. The leaf section is recognised as of importance in determining species of *Dicranum* (p. 104); *Dicranum molle* is transferred to the section *Eu-Dicranum*. The var. *laxa* Milde, of *Fontinalis antipyretica* (p. 391) and var. *hamulosum* Schp. of *Hypnum elodes* (p. 505) are recognised as British, without being given full status in the text. *Thuidium decipiens* De Not. will be found amongst the *Harpidia* as *Hypnum decipiens* Limpr. Five counties are mentioned as producing *Dicranum undulatum* (p. 109). The Census Catalogue mentions two others, Fife with Kinross and Yorkshire. The Market Weighton station was published in Fraser Robinson's 'Flora of the East Riding,' and the plant has been seen there during the present year. The treatment of *Mollia thrausta* Stirt. (p. 245) is not in agreement with that in the *Journ. Bot.*, 1923, p. 52, where it was given as a synonym for *Trichostomum tortuosum* var. *fragifolium*; a similar discrepancy occurs with *Zygodon teichophilus* Stirt. (p. 257), which is here given as a synonym for *Z. lapponicus*, but is placed under *Z. Stirtoni* in *Journ. Bot.*,

1923, p. 69. In addition to Corrigenda on p. 560, a few errors should be noted by students :—

Tab. XII.—The individual figures are misplaced. If re-lettered in the following order, C, D, E, A, B, the description at foot of plate and the text references, p. 94-97, will be correct. Tab. XVII.—The description at foot of plate needs correction, *D. taxifolius*, *E. adiantoides*, *F. decipiens*. The text references, pp. 133-4, are correct ; omit the first *i* from *Osmund(i)oides*. Tab. XLII.—For *Bryum purpureum*, read *purpurascens*. Tab. XLIV.—*Bryum affine* and *pallescens* are so much alike in vegetative characters that it is a matter of indifference which C and D stand for, but compared with Ed. II. the names have been transposed. Page XXXIV.—In the General Key, Sec. 15, for 15 read 16, several corresponding changes follow. Pp. 43-44.—Transpose the references to B and C, Tab. VI. The plate is correct. Page 129.—Incorrectly numbered. Page 137-8.—Key to Grimmia, Sec. 6, for 12, read 13 ; the following numbers above 12 (except 20-21) need a corresponding correction. Page 494, line 22, add 'and LVII.'—W. H. B.

In the High Himalayas, by **Hugh Whistler**. London : H. F. & G. Witherby. 223 pp., 15/- net. The author has had the privilege of visiting a portion of the world little known to English people, and the photographs of houses and natives, landscapes and bridges, at once give an appetite for an interesting narrative, and certainly the record is a readable one, as well as exceedingly valuable from a scientific point of view. Incidentally the author touches upon the topography, religion, birds, game birds, the Ibex, etc. The last chapter deals with 'Birds by the Wayside in Lahul and Spiti,' and we are introduced to the Choughs, Ravens, Redstarts, Shrike, Finches, etc.

Water-Folk at the Zoo, by **Gladys Davidson**. London : Methuen & Co., x.+118 pp., 5s. net. Dealing with another section of life in the Zoo is a work which has been made possible by the recent introduction of the Aquarium. There are 118 pages in this book, which is made bulky by the use of unnecessarily thick paper. There is an excellent coloured frontispiece of the Striped and Red Chichlids, and numerous illustrations in black and white in the text, from sketches. There are twenty-six small chapters dealing with the various aspects of marine life illustrated in the new Aquarium, and doubtless this book will form an additional attraction to the well-known Regent's Park Exhibition.

In Southern Seas, by **W. Ramsay Smith**. London : John Murray, xviii.+297 pp., 16s. net. As a medical man the author of this work in his visits to Australia has seen much more than would have been observed by an ordinary traveller. In a series of two dozen more or less 'chatty' articles we are introduced to the Southern Seas, New Caledonia, the New Hebrides, various items of anthropological interest, such as body-scarring, skull moulding, bodily decorations, etc. ; the Great Barrier Reef, alligators, pelicans, cockles, and manners and customs of Australia and Aborigines. The reader will not be bored by too technical details. Those fond of travel and adventure will find much to interest them in this book, and the naturalist and anthropologist may get some fresh items of information.

Impressions of Great Naturalists, by **Henry Fairfield Osborn**. London : Charles Scribner's Sons, xxviii.+216 pp., 21s. 6d. net. It is fortunate that Professor Osborn has been prevailed upon to give his impressions of great naturalists as he has been able to see some of them through spectacles rather different from those of the average person. In this series of essays he gives many interesting remarks on Wallace, Darwin, Huxley, Balfour, Pasteur, Leidy, Cope, Muir, Burroughs, Roosevelt, Bryce and Butler, all of which are well worth perusal, and throw interesting sidelights into the characters of some of our greatest men, which are very welcome. Each chapter is illustrated by a photograph of the subject dealt with, which adds to the interest of the volume

NORTHERN NEWS.

The Amateur Aquarist and Reptilian Review is now the organ of the British Aquarists' Association.

In case our readers have not noticed it, may we state that *The Naturalist* is now being printed on better paper than it was last year!

We regret to record the death of J. S. Cooke, J.P., F.R.A.S., who has been a member of the Yorkshire Naturalists' Union for thirty-three years.

Under the recent new rule of the Zoological Society of London whereby professional zoologists are admitted, Mr. T. Sheppard, M.Sc., has been elected a Corresponding Member of the Society.

Particulars of over five hundred different Picture Post-cards on sale at the British Museum (Natural History), South Kensington, are given on 'Form 170,' which can be obtained at the Museum.

The Fifty-fourth Report of the Libraries, Art Gallery and Museums Committee of the City of Bradford, for the year ending August, 1924, includes half a page devoted to the Natural History Museum.

Mr. R. W. Goulding, F.S.A., has produced an excellent account of Henrietta Countess of Oxford, which is profusely illustrated. All interested in history must be grateful to Mr. Goulding for his constant supply of useful work.

The Governing body of the Imperial College of Science and Technology has decided that it is undesirable to retain type specimens for teaching purposes, and such specimens have now been transferred to the national and other museums, where they are likely to be of greater service to the student.

The Fifth Edition of 'Outline Classification of the Animal Kingdom,' by Professor Sydney J. Hickson, has been issued by the Manchester Museum (Publication 87, 28 pp., 6d.). The various reprints of the prefaces which are included give an interesting index to the changes wrought in classification since the first edition of this list appeared in 1891.

According to the press, Dr. H. M. Ami, one of Canada's leading geologists, stated that fossils of the Aurignacian period, when early man began to carve and cut bone with flint tools, can be discovered in England. These implements, he declared, are 50,000 years old and may be found in gravels in the south-eastern counties. Especially are the remains of earliest man abundant and promising. Scientists were busy unearthing not only their [*sic*!] skulls and bones, but also those of animals.

We have received in a somewhat battered and broken state, due to the prevailing postal conditions, an almanack issued by the British Museum (Natural History), South Kensington, for 1925. This contains a view of the building, and on the front a few particulars about the Museum, times of opening, etc. On the back is a list of the staff, which includes the names of the labourers and lavatory attendants; particulars of recent important acquisitions, and postal rates.

At a recent meeting of the Linnean Society of London, Prof. F. W. Oliver, F.R.S., exhibited a series of lantern-slides. The subjects shown included a ditch with *Azolla*; a dead larch-tree, showing dry and wet weather positions; the development of a salt-marsh at Erquy after 18 years; the spread of *Spartina Townsendii* at Poole Harbour after 13 years; the rise of sand-dunes under *Psamma* at Blakeney Point; and a topographical series of aeroplane photos from the same locality.

J. D. Kendall, whose work in the Lake District is well known, writes on 'A Supposed Glacier-Lake in West Cumberland' in *The Geological Magazine* for December, and in the same Journal, Messrs. E. J. Garwood and E. Goodyear recommend the name *Dibunophyllum bourtonense* in place of that previously given and described in their paper on 'The Carboniferous Succession in the Settle District,' published in *The Quarterly Journal of the Geological Society* for August.

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THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL
PRINCIPALLY FOR THE NORTH OF ENGLAND.

EDITED BY
T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums Hull;

and T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Technical College, Huddersfield,

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
G. T. PORRITT, F.L.S., F.E.S.
JOHN W. TAYLOR, M.Sc. RILEY FORTUNE, F.Z.S.

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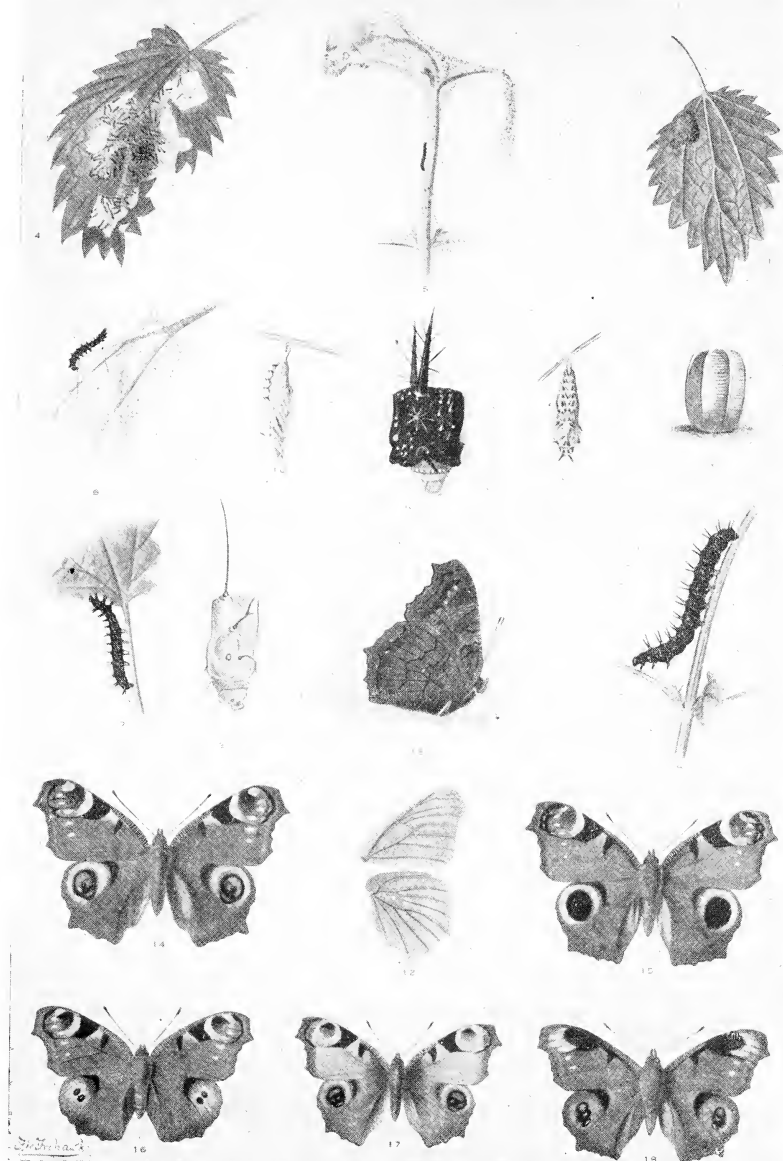
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- FIG. 1 Eggs in situ, laid noon 16.v.1908, five days old, drawn 21.v.08
 .. 2 Egg 36 days old, drawn 22.v.08 (30x)
 .. 3 Seventh segment of larva directly after emergence, drawn
 .. 4 Larva 24 hours old, drawn 31.v.08
 .. 5 Larva before 2nd moult, 9 days old, drawn 8.vi.08
 .. 6 Larva before 3rd moult, 13 days old, drawn 12.vi.08
 .. 7 Larva before 4th moult, 18 days old, drawn 17.vi.08
 .. 8 After 4th moult, 28 days old, drawn 1.vii.08
 .. 9 Seventh segment fully grown larva, drawn 30.vi.08
 .. 10 Pupa 6 days old, drawn 7.vii.08
 .. 11 Pupa 6 days old, drawn 7.vii.08

- FIG. 12 Neuration
 .. 13 ♀ F. W. F. coll.
 .. 14 ♀ F. W. F. coll.
 .. 15 ♀ Whitehaven, Cumberland Bred about 1866 *Ento*
 .. Vol. III, p. 212. R. Adkin coll.
 .. 16 ♀ Southport, Lancs. captured about 1866. *Ento* Vol. III,
 .. p. 212. R. Adkin coll.
 .. 17 ♀ 1901 Bred, Newport, Mon. F. W. F. coll.
 .. 18 ♂ From Harper's coll. Stevens' sale, 20.3.34. A. B. Farr, coll.

NOTES AND COMMENTS.

FROHAWK'S BRITISH BUTTERFLIES.*

Messrs. Hutchinson and Co. have been good enough specially to prepare for us the block appearing on the opposite page, which is a very small reproduction in black and white of one of the marvellous coloured plates which appears in the sumptuous publication which the firm is issuing under the above title. As with other excellent publications which have appeared in recent years, the price might at first be considered prohibitive, but few people at all interested could resist the temptation of purchasing the volumes after they had seen the plates. Each plate measures $9\frac{1}{2}$ ins. by $14\frac{1}{2}$ ins. and contains on an average two dozen figures reproduced by the three- or four-colour process, but retaining the most delicate tints with a fidelity which is unusual even for that excellent process. Mr. Frohawk not only illustrated the various forms of each species and under and upper surfaces, etc., but gives anatomical details, illustrations of food plants, the eggs, the larva in various stages of growth, pupæ, etc. A general idea of Mr. Frohawk's plan can be taken from the reproduction herewith, but even this excellent block is miserably inadequate when compared with the plate itself. The accompanying letterpress occupies six pages, and each of the species is similarly dealt with. The sub-title of the work states that it is a 'complete original descriptive account of the life-history of every species occurring in the British Islands, together with the habits, time of appearance and localities.'

SIXTY-EIGHT BRITISH BUTTERFLIES.

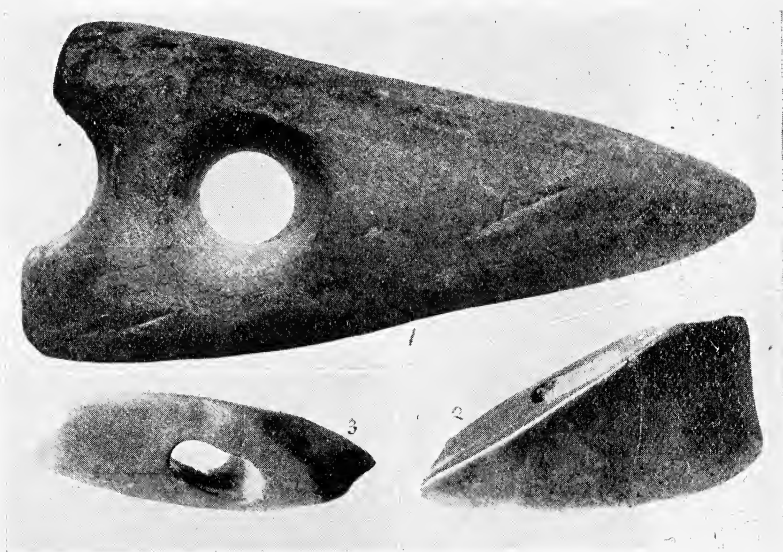
We so whole-heartedly agree with Lord Rothschild's remarks in the Preface he contributes to the volumes that we feel we must quote them. He states that the work 'Embodies a new idea in that it contains a complete series of drawings—of truly remarkable excellence—of every phase of the life cycle of all of our sixty-eight British butterflies. The reader will find before him an accurate illustration—accurate both as regards form and colour—of the appearance of each stage of these insects as it occurs in the natural state in these Islands. As regards the letterpress also the book is unique in that it is the only work in any language that contains a complete account of the life-history of all these sixty-eight insects. The book cannot fail to appeal to lovers of nature—to the entomologist, and to the general naturalist, and to those who love the country for its own sake, and, finally, though perhaps not least, to the artist whose admiration must be elicited by

* Natural History of British Butterflies. London: Hutchinson & Co., 2 volumes, x. + 207 pp., and viii. + 206 pp., £6 6s. net.

the exquisite miniatures which Mr. Frohawk's brush have produced. As the reproduction of the drawings has been effected with the highest technical skill, the writer feels that those who are most competent to judge will agree that Mr. Frohawk is deserving of all congratulation on the successful completion of a most valuable piece of work, which is unlikely to be superseded.'

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* 95 pp., 1/-.

at the disposal of the readers. We are permitted to reproduce one of the illustrations herewith.

IRON ORES.

Of more particular interest to northern geologists is Volume VIII. of the 'Special Reports on the Mineral Resources of Great Britain.' Iron Ores—Hæmatites of West Cumberland, Lancashire and the Lake District (*Geol. Survey Memoir*), 236 pp., 5 plates and 31 text figures, by Dr. Bernard Smith; a second edition of which has been called for. In this Memoir of the Geological Survey an account is given of all Hæmatite Mines in work, or recently in work, in the West Cumberland and Furness districts, and of many of the abandoned mines. The ore occurs chiefly in the Carboniferous Limestone and the older rocks of the Central Lake District. Detailed accounts of the mines are preceded by a general description of the geology of the iron-fields; the variety, constitution, analyses and statistics of output of the ores, and their probable origin and date of formation. Reserves and future prospects are also discussed, and the importance of a knowledge of the character and occurrence of the younger rocks that overlie the Carboniferous Limestone is emphasised. The Memoir, on revision, has been considerably enlarged, and the information about working mines brought up to date. New text figures and plates have been inserted, as well as a list of plans of abandoned mines.

EARLY LEEDS GLASS HOUSES.

At a recent meeting of the Society of Glass Technology, held at Sheffield, Mr. F. Buckley read a 'Note on the glass-houses of the Leeds district in the seventeenth, eighteenth and early nineteenth centuries. John Houghton, writing in 1691, stated that there were then three glass-houses in Yorkshire, one near Ferrybridge and two near Silkstone. The only glass-house actually in or near the town of Leeds in the eighteenth century was known as the Engine Glass-house, which can be traced between 1738 and 1770. The Engine Glass-house might have been the parent as well as the predecessor of the famous Hunslet Glass Works. Between 1814 and 1861, at any rate, the Bower family had several factories here. Leeds must have owed as much to this family in the nineteenth century as it did to the Fennys in the previous century. In 1883 they had four glass-houses at work, and no competition in the town itself. Just before 1850, however, there was a sudden increase in the glass concerns in Leeds and the surrounding district, especially in the neighbourhood of Castleford. An early nineteenth century glass-house at Thornhill Lees can be traced back to 1830. Here Noah

Turner made flint glass until the glass-house was taken over by the Kilners in 1844, and converted into a bottle works. There was a glass-house also at Worsborough Dale prior to 1830, worked by William Usherwood, and in the year 1828 Messrs. Wood and Perkes were found in possession, making cut glass.'

HOW NOT TO FORM A MUSEUM.

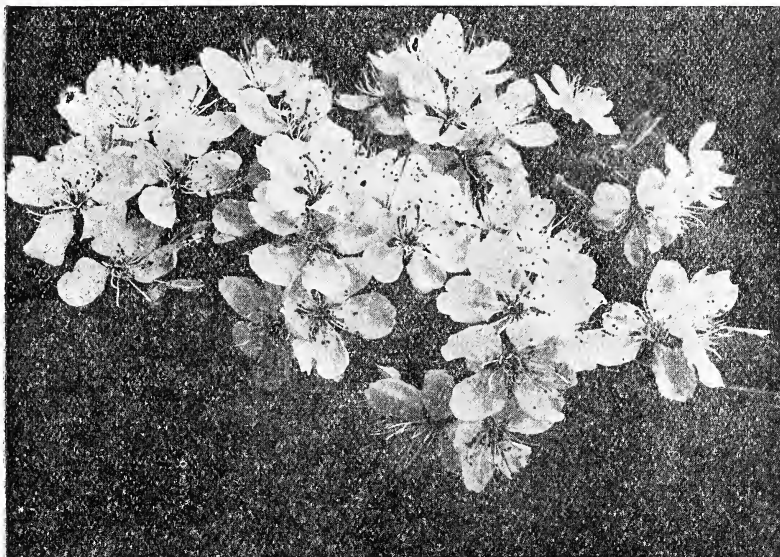
We have received a letter from a Councillor at a place near Manchester, which was addressed to the Lord Mayor of a large northern city. It appeals for specimens for a new museum which is in contemplation, such museum to be for the 'education and instruction of the young in the district.' Apparently similar appeals are being sent round the country, and if so we can see the suggested 'educational' institute being a kind of marine store, and containing all the odds and ends which the various institutions in the country will be glad to get rid of. We would suggest that in cases of this sort, the best thing to do is to appoint a curator and let him make arrangements about the specimens, otherwise it is probable his first duties will be to send to the refuse destructor the accumulation of material which has been made as a result of the appeal.

GREAT BUSTARD IN SCOTLAND.

Mr. H. S. Gladstone has an admirable paper on this subject in *The Scottish Naturalist*, No. 150. The first British author to give an account of the species appears to be Hector Boethius, or Boece, in 1526. About ten years later John Bellenden's translation of Boece's work appeared, and the reference to the Bustard—then called *gustardis* (= slow goose)—is as under:—'Beside thir thre [viz. Capercaillie, Red Grouse and Blackgame] uncouth kynd of fowlis, is ane uthir kynd of fowlis in the Mers mair uncouth, namit *gustardis*, als mekle as ane swan, bot in the colour of thair fedderis and gust of thair flesche thay ar litil different fra ane pertrik, thir last fowlis ar not frequent bot in few noumer. And sa far haytis the company of man, that gif thay find thair eggis ayndit or twichit be men, thay leif thaym, and layis eggis in ane othir place. Thay lay thair eggis in the bair erd.'

WILD PEARS.

We are permitted, by the courtesy of the publishers of Hutchinson's well-known 'Trees and Flowers of the Country-side,' to reproduce two of the blocks which have appeared in that publication, as we feel they will be of interest to our readers. We have also quoted the descriptions given in that publication. No. XVII. of the work in which these plates appear, has a beautiful coloured plate of Pasque-Flowers, specially prepared by Mr. E. C. Mansell. This species 'Is



Flowers of Wild Pear.

The flowers of the Wild Pear are to be seen in May. They are very like those of the Crab, but are pure white instead of pink-tinted.



Fruit of Wild Pear.

Wild Pears are very like miniature garden pears, being only from an inch to two inches in length. They are not edible, and are therefore sometimes called 'Choke Pears.'

only found in England, from Yorkshire southwards to Essex and Gloucester, and is of quite local distribution. The short flower stems appear before the leaves, and, later, the flower-buds nestle among the hairy thread-like segments of the unexpanded leaves which surround them. There are no petals, and the violet-purple sepals are clothed on the outside with fine silky hairs. The name is derived from an old custom of staining Easter eggs with the sepals of the flowers."

YORKSHIRE GEOLOGISTS.

The Yorkshire Geological Society has produced Part I. of Volume XX. of its *Proceedings*, edited by H. C. Versey and H. E. Wroot, the scientific contents of which are quite up to the standard attained by the Society in previous years. Mr. G. W. Lamplugh, F.R.S., gives a Review of the Speeton Clays, a subject on which no one can write with more authority. It formed the subject of his Presidential Address, delivered at York in December, 1922, and also contains a summary of publications issued since 1892 bearing upon the subject. Mr. C. Thompson's paper on 'The Erosion of the Holderness Coast' is based on his address at the Hull meeting of the British Association, and is welcome in its present and detailed form. Mr. Thompson bases his conclusions upon careful measurements on the six-inch ordnance maps of 1852, and the new cliff line in 1922. Sixty-six such measurements seem to show that in recent years the loss has been less than has generally been accepted. Mr. W. S. Bisat has his important paper on 'The Carboniferous Goniatites of the North of England and their Zones,' in which the numerous illustrations from photographs, by Mr. M. H. Stiles, will assist considerably in the study of the subject in the future. Mr. R. G. Hudson has an interesting paper on 'The Rhythmic Succession of the Yoredale Series in Wensleydale,' and Mr. Sheppard brings the Bibliography of Yorkshire Geology, originally published by the Society, up to date by contributing the titles of papers issued during 1922 and 1923. The concluding note in this important publication, by Professor E. J. Garwood, relates to maps illustrating the Zonal Succession in the Lower Carboniferous Rocks of the Settle District, which recently appeared in the *Quarterly Journal of the Geological Society*, and are here reproduced. These will be welcomed by every Yorkshire geologist. By the use of thicker, though inferior, paper, the publication is much more bulky than would be if printed on the paper usually adopted by the Society, and possibly the carelessness with regard to the use of broken type, wrong fonts, and in the use of leads, and stitching, is to be expected, seeing that the printing has been transferred from Hull to Leeds. Seriously, however, the

typography is not up to the standard which we expect from this important Society, and from that point of view is its worst production.

PLEISTOCENE CLASSIFICATION.

The Proceedings of the Geologists' Association, recently issued, edited by Mr. A. K. Wells, contains, as its first item, the Presidential Address of Mr. S. Hazzledine Warren, on 'Pleistocene Classifications,' in which he states : 'I am generally of an independent temperament, but as time has gone on I have broken away more completely from the influence of the weight of opinion which gives the maximum cold of later Pleistocene times to the Mousterian. I have come to realise (as I now think) more adequately the import of the Magdalenian evidences, when a vast area of Western Europe was under the sway of Arctic tundra conditions, with the Reindeer fauna extending as far south as Mentone. We should not overdo scepticism upon the value of fauna and flora as an index of climate, because the Arctic fauna and flora did not occupy this territory before, and did not occupy it after the Upper Palæolithic epoch. It was a temporary invasion for a brief geological period, and the previously existent fauna and flora came back (with some losses and changes) and re-established itself again in its old home. It was a biological revolution and counter-revolution of the first magnitude. I cannot now doubt that these European evidences must be correlated with the Ponders End Stage of south-eastern England.'

THEORY AND FACTS.

'In conclusion, my general moral of the whole matter is that we need less theory and more facts, such as the members of the Geologists' Association may harvest from the fertile soil of England.' Mr. Hazzledine Warren also draws attention to the fact that 'Some theories of classification have been based upon a flake from Cambridge of supposed late Palæolithic date. I examined this in association with several of my friends who are acquainted with flint flaking, and we unanimously agreed that it was a natural chip, and not a human artifact.' Of such bricks are the castles of some of our Prehistorians made.

TRANSFUSION.

The Royal Society had some interesting meetings in the seventeenth century—as shown by the references thereto appearing in *Nature*. In 1667, 'Mr. Coga, being introduced, gave an account of the effects of the experiment of transfusion repeated upon him, viz., that he found himself very well at present, though he had been at first somewhat feverish upon it; which was imputed to his excess in drinking too much wine soon after the operation.'

SYMPATHY POWDERS.

In 1663, 'Occasion being given to discourse of tormenting a person with the sympathy-powder, Dr. Wren related, that in the house of a kinsman of his, the experiment had been tried by him upon a servant, who had grievously cut her finger; and a rag rubbed upon the wound being dressed with calcined vitriol, and put into the maid's bosom, her finger within a short time was cured. Whereupon he had taken the rag from her and heated it upon the fire, whilst the maid was sweeping the next chamber; who, upon a sudden, flung away the broom, and cried out for the pain in her finger; which being looked to was found very fiery: upon which they cooled the rag again, and dressed as formerly, and within a day or two the finger was intirely cured. Mr. Boyle undertook to try this experiment upon a dog.'

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The Proceedings of the Geologists' Association appears to be the first geological publication to give what is described as a 'Close-up photograph': presumably the editor is a frequenter of the 'movies.'

The Proceedings of the Linnean Society of London, December, 1924, contain an obituary notice of Thomas Frederick Cheeseman, who was born at Hull in 1846, and was taken to New Zealand by his parents in 1854. He became an authority on the Flora of New Zealand. In 1874 he was appointed Secretary and Curator of the Auckland Institute. He wrote 101 papers bearing upon the Islands, mostly botanical, but 22 referred to geology or ethnography.

The Report of the Dove Marine Laboratory, New Series, No. 13, for the year ending June 30th, 1924, edited by Dr. A. Meek, contains quite a valuable series of papers particularly useful from their economical aspect. These are 'Herring Shoals and Faunistic Notes,' by B. Storrow; 'Size of Herrings, Vitality of Young Plaice,' by D. Cowan; 'Pollution of the River Tyne,' 'Salinity of Inshore Waters,' by E. M. Meek; 'Estuarine Plankton of River Coquet,' by O. M. Jorgensen. There are also smaller notes on Plankton Investigations.

The Botanical Society and Exchange Club of the British Isles Report for 1923 has been issued (366 pp., 10/-), and the *Report for 1923 of the Botanical Exchange Club* (45 pp., 4/-). The first is a particularly substantial volume, and contains a wonderful summary of the activities of various botanists throughout the British Islands, although oddly enough in the list of the various publications containing information likely to interest the members of the Club, Dr. Claridge Druce, the Secretary, seems to have forgotten a publication called *The Naturalist*. Students of plant distribution will find much to interest them in these pages.

The Transactions of the British Mycological Society, Vol. X., Parts I. and II., published in one cover, contains an exceptionally valuable series of articles, including 'Some Aspects of Lichenology,' by O. V. Darbishire; 'Studies in Entomogenous Fungi,' by T. Petch; 'Three Diseases of Cultivated Mushrooms,' by F. E. V. Smith; 'Apple Rot Fungi in Storage,' by M. N. Kidd and A. Beaumont; 'The Cause of Citrus Scab,' by E. M. Dodge and E. J. Butler; 'Notes on the Association of *Tilletia Tritici* with "Epileptiform Convulsions" in the Dog,' by J. Russell Greig; and 'A New Disease of the Gramineæ: *Pleosphaeria Semeniperda* nov. sp.,' by C. C. Brittlebank and D. B. Adam.

ADDITIONS TO YORKSHIRE DIPTERA.

CHRIS. A. CHEETHAM.

THE following list is due largely to the visit of Mr. F. W. Edwards to our area in June last year. The collecting grounds were :—**WHERNSIDE**: Here most of the species were obtained in Force Ghyll, on the east side of the mountain. The water drains into Chapel-le-dale, and there are some fine waterfalls. Most of my Whernside records are from this locality. **COVERHAM**: The wooded stream-side just above the bridge near the abbey. **PATELEY**: The deep cleft of Ravens Ghyll, well wooded and damp.

I am also indebted to Mr. Edwards and to Mr. J. E. Collin for help in identifying the species to which their names are added in brackets.

The references at the end of the records are :—

A=C. A. Cheetham. B=F. W. Edwards. C=J. E. Collin.

- Sciara pilosa* Staeg. Coverdale, 17/6/22, Ryedale, Farnley, A (B).
S. flavicauda Zett. Austwick, 23/6/23, A (B).
S. hispida Winn. Austwick, 23/6/23, A (B).
S. bicolor Mg. Whernside, 11/8/24, A (B).
S. carbonaria Mg. Allerthorpe, 18/9/23, A (B).
Mycetophila fraterna Winn. Pateley, B, 23/6/24.
Brachypeza spuria Verr. Pateley, B, 23/6/24.
Docosia valida Winn. Pateley, B, 23/6/24.
Exechia fimbriata Lundst. Pateley, B, 23/6/24.
E. contaminata Winn. Pateley, B, 23/6/24.
E. nigra Edw. Pateley, B, 23/6/24; Austwick, A (B).
Phronia annulata Winn. (*braueri* Dz.). Austwick. Bred from timpet-like pupæ, A (B).
P. signata Winn. Ingleton, 19/6/24, B.
Sceptonia fumipes Edw. This was recorded as *S. concolor* (B).
Chironomus pedestris Mg. Coverham, B, 23/6/24.
Orthocladus ictericus Mg. Whernside, B, 20/6/24.
Tanytus lentigenosus Fries. Whernside, B, 20/6/24.
T. notatus Mg. (Verr. col.), Whernside, B, 20/6/24.
T. longimanus Staeg. Pateley, B, 23/6/24.
Culicoides heliophilus Edw. Pateley, B, 23/6/24.
Palpomyia (Ceratopogon) brachialis Hal. Coverham, B, 23/6/24.
Probezzia (Ceratopogon) bicolor Panz. Austwick Moss, B, 19/6/24.
Isohelea (Ceratopogon) nitidula Edw. Whernside and Coverham, B.
Serromyia (Ceratopogon) morio F. Austwick Moss, A (B).
Dixa dilatata Strobl. Austwick Moss, B, 19/6/24.
D. nubilipennis Curt. Austwick and Coverham, B.
Rhabdomastrix (Goniomyia) schistacea Mg. Coverham, B, 23/6/24.
Trimicra pilipes F. Everingham, H. M. Stuart.
Trichocera major Edw. Austwick, 7/1/23, A (B).
Tricyphona schummeli Edw. Pateley, B, 23/6/24.
Beis clavipes L. Adel, T. B. Kitchen, 15/6/24; Crag Wood, A, 22/6/24.
Rhamphomyia cinerascens Mg. (of list). Austwick, A, 25/5/24 (C).
Euthyneura gyllenhalii Zett. Pateley, 23/6/24, B.
Dolichopus longicornis Stan. Wistow, Ulleskelf, A, 13/7/24.
Hypophyllus crinipes Staeg. Thorner, 21/6/24, A.

Chrysotus blepharosceles Kow. Ulleskelf, 13/7/24, A.

Syntormon sulcipes Mg. Adel, 27/6/24, A.

Sympycnus æneicoxa Mg. Bramhope, 11/7/24, A.

Systemus adpropinquans, recorded on p. 411, 1921 *Naturalist*, is an error, and should be deleted.

Hylephila personata Coll. Holme, E.R., 17/5/24, A (C).

Leria kerteszi Czerny. Austwick, 7/1/23, A (C).

Lonchæa Deutschii Zett. (Coll.). Holme, E.R., 17/5/24, A (C).

Hyadina guttata Flin. Austwick, 8/10/24, A.

Camilla (Noterophila) glabra Flin. Saxton, 12/7/24, A (C).

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EXPERIMENTS WITH MOORLAND PLANTS.

In *The New Phytologist*, Volume XXIII., No. 5, pp. 288-292, Dr. M. C. Rayner has some very valid criticisms of the culture experiments with moorland plants placed on record by Miss Hinchcliff and the writer in *The Naturalist*, July, 1924.

Dr. Rayner draws attention to two points. In the first place it must be conceded that her criticism of relatively high concentration of salts used for watering the sand cultures is justified, both Graebner and Dr. Rayner having drawn attention to the need for dilute solutions for such plants. These cultures were incidental to the main line of work in progress, and culture solutions were adopted in line with those in use in other experimental work in progress in the laboratory. The brief paper in *The Naturalist* was equivalent to a stock-taking upon dissolution of partnership, and all results were placed upon record which it was thought might prove useful to subsequent workers. When the paper was written other investigators had the problem of cultures of moorland plants in hand, working in collaboration with Dr. W. H. Pearsall, and in view of the results arriving in that work it did not seem irrelevant to place on record the fact that, with these relatively strong solutions, the most unhealthy plants were found associated with the highest proportion of lime.

Dr. Rayner's second criticism is directed to the varying proportion of nitrate in the culture. This suggested source of error is of great interest, and must be considered in further work. She would probably agree, however, that as a tentative solution of the results briefly recorded, the varying lime content seems adequate, and the results were not regarded as sufficiently important to justify extended discussion.

With reference to her discussion of the fat content of the sterile seedling, the writer would like to point out, in view of the reference to fast as photosynthetic products, that, as has been fully explained elsewhere, the fats accumulating behind the growing points of the root are regarded as arising, as bye-products possibly, from the active chemical metabolism proceeding in the growing root tips, in which the complex chemical process of manufacture of protoplasm is actively proceeding. Their accumulation depends upon the chemical changes at the root-tip, and is only indirectly affected by the synthesis of sugar and starch, for instance, in the leaves.—J. H. PRIESTLEY.

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The Ray Society has issued Volume II. of their Monographs on **The British Charophyta**, by J. Groves and G. R. Bullock-Webster (xi.+129 pp.), which is made invaluable to students by the numerous plates (22-45) containing details of the structure of various species of *Cara*. This is an essential volume to all students of this difficult order of plants.

CUMBERLAND COLEOPTERA AND HEMIPTERA IN 1924.

F. H. DAY, F.E.S.

ALTHOUGH the wretched weather last year made field work anything but pleasant, Coleoptera on the whole did not seem to be adversely affected, and whenever I went out collecting something more or less interesting invariably turned up. Chief interest attaches to *Haliphus apicalis* Th. (Kirkbride, 21/6/24), *Colon latum* Kr. (Caldbeck, 20/4/24), *Coenoscelis pallida* Woll. (Middlesceugh, 19/7/24), and *Ephistemus globosus* Waltl. (Orton, 14/6/24), all new to the county list, published in the *Trans. Carlisle Nat. Hist. Soc.*, Vols. I., II., and III. The census of Cumberland beetles is thus brought up to 1802 species.

In February I tried flood refuse, but not quite under the right conditions, and the only species worth noting are *Oxyptoda lividipennis* Man., *Tachyporus tersus* Er., *Ancyrophorus omalinus* Er., *Paramecosoma melanocephalum* Hbst., and *Ceuthorrhynchus erysimi* F. At a haystack in March I took *Atheta malleus* Joy., and a swarm of *Cryptophagus pallidus* Sturm. I spent the Easter holidays in the Caldbeck district with my sons, mostly tramping among the hills, and little time was available for entomological work, but I noted that the Wood Ant (*F. rufa* L.), recorded from this district by Mr. Murray (*The Naturalist*, 1921, p. 182), has apparently increased considerably, as in a wood near the village there were dozens of nests in a state of great activity. Some of these I worked for myrmecophilous beetles, and found *Myrmedonia humeralis* Gr. and *Notothecta flavipes* Gr., both new locality records for Cumberland. Among the hills in waterfall moss *Hydroporus rivalis* Gyll., *Dianous coerulescens* Gyll., and *Lesteva pubescens* Man. were common.

The afternoon of Saturday, May 17th, was bright and warm, and I spent a few hours in favourite haunts at Orton. The locality is one of rough woodland and meadow on a heavy, boggy soil, much overgrown with sphagnum and moss. On this occasion I took *Euconnus hirticollis* Ill. rather freely, *Neuraphes elongatulus* Müll., *Bythinus puncticollis* Den., *Biblopectus ambiguus* Reich., *Gymnusa brevicollis* Pk., and *Olophrum fuscum* Gr. One object of this outing was to take *Elleschus bipunctatus* L., a little grey weevil attached to sallow, usually obtainable at the time of year when the catkins are dropping and the leaves developing. The bushes were just in the right condition, but the weevil was not at all common until I came upon a stunted little bush growing in a boggy place which had very few leaves or catkins upon it. On beating its few twiggy branches a veritable shower of *E.*

bipunctatus tumbled into the net, far more than I wanted. Curious to account for this extreme localized abundance, I beat other bushes similarly stunted and sparsely covered with leaves, but failed to find more than odd specimens upon them.

During the next ten weeks I obtained a fair amount of collecting without going far afield. At Thurstonfield lough I fished up *Agabus femoralis* Pk. and *A. unguicularis* Th., and found *Notiophilus substriatus* Wat., *Blethisa multipunctata* L., *Dyschirius aeneus* Dj., *Philonthus micans* Gr., and *Evaesthetus ruficapillus* Lac. on the muddy and mossy margins, where also the bug *Salda littoralis* L. was jumping about in its usual lively way. On the salt-marshes of the River Wampool I spent several afternoons, and took among other species *Bembidium lunatum* Duft., *B. aeneum* Germ., *Haliplus fulvus* F., *Hydroporus lituratus* F., *Helophorus mulsanti* Rye., and *Ochthebius viridis* Peyr.; the last-named has only occurred on one occasion previously in this county. The only water-bug present in these pools was *Corixa striata* L. An evening spent in the Nature Reserve at Kingmoor, devoted, however, to observation rather than collecting, showed *Apion genistae* Kirb. (one of this charming locality's most interesting products) to be unusually abundant on its food-plant, the Petty Whin. I have not found this beetle elsewhere in Cumberland. A showery afternoon, finishing in a steady downpour, was spent in the Brampton district on the banks of the River Irthing, but the weather did not affect the appearance of *Bembidium schuppeli* Dj. and *B. atrovioleaceum* Duft., both of which were common, other useful captures being *Lesteva monticola* Kies., *Georyssus crenulatus* Ross. and *Cryptohypnus dermestoides* Hbst. The sides of the River Caldew at Cummersdale also produced several species of interest, including *Bembidium monticola* Stm. and *B. prasinum* Duft., while *Helophorus arvernensis* Muls. was exceptionally common; from a patch of wet sandy loam about a foot square I picked over fifty specimens in a few minutes.

On Whit Monday I went to Cumwhitton Moss, where *Sericus brunneus* L., *Scymnus suturalis* Thunb., *Salpingus castaneus* Pz., *Anaspis rufilabris* Gyll., *Donacia discolor* Pz. and *Rhinomacer attelaboides* F. were taken. There were some interesting beetles again at Orton in June. *Meligethes* var. *aestimabilis* Reitt. came sparingly from the Water Avens, and the handsome Skipjack, *Corymbites pectinicornis* L., was captured on the wing in the sunshine. I have already noted the occurrence in numbers on alder of *Anoplus roboris* Suf. (*Ent. Mon. Mag.*, 1924, p. 153). This species is quite confined to alder, its near ally, *A. plantaris* Naez., abounds in the locality, but always on birch. *Orchestes stigma* Germ. came from willow, and a single *Zeugophora subspinosa* F.

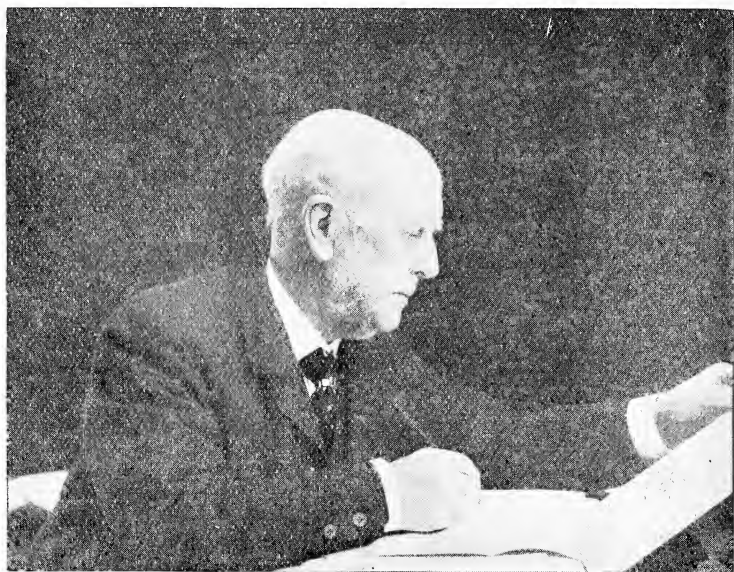
was beaten from a mixed hedgerow, this being the third specimen I have taken in Cumberland, all in this locality. On long grass, under trees and bushes, *Malthodes fuscus* Waltl. was common, and varied much in size and colour. On a patch of *Rumex*, in a meadow, I found a strong colony of *Apion affine* Kirb. with other commoner members of the genus. A visit in early July to Newton Reigny Moss found this productive locality in such a waterlogged state that collecting was restricted, and all my captures were of familiar species, the most interesting being two fine males of the *Capsid* bug, *Teratocoris saundersi* D. and S. The following day I tried ground of quite a different character—Gelt Woods, to the east of Carlisle—and here the sweep net disclosed *Hemiptera* in some numbers, *Calocoris alpestris* Mey. being common on Woundwort, *Tetraphleps vittata* Fieb., *Cyllocoris flavonotatus* Boh., *Calocoris ochromelas* Gmel. and others also turning up freely. The best beetle found was *Corymbites impressus* F., I believe new to this locality, and among various species of *Malthodes* were several *flavoguttatus* Kies. On hedgebanks outside the woods, *Phyllobius viridicollis* F. occurred in the greatest profusion. Sweeping hedgebanks nearer the town on several evenings revealed numerous species, the best being *Tropiphorus tomentosus* Marsh., *Brachysomus echinatus* Bons., *Apion punctigerum* Pk., *Tachyporus solutus* Er., *Mycetoporus longulus* Man., *Megarthrus sinuaticollis* Lac., and *Meligethes brunnicornis* Stm. Towards the end of July I spent some time beating and sweeping in the valley of the Roe near Middlesceugh, where both beetles and bugs were abundant. Among the beetles I got *Ochina ptilinoides* Marsh. from ivy on old trees, *Crepidodera rufipes* L. on vetch, *Orchestes pilosus* F. from oak, *Anaspis latipalpis* Schils. from rose, and three specimens of *Rhagonycha translucida* Kry. from long grass. Hazel was very productive of *Hemiptera*, *Phylus coryli* L. in particular being common and variable, other captures being *Orthotylus tenellus* Fall., *O. viridinervis* Kb., *O. marginalis* Reut., *Psallus ambiguus* Fall., *P. lepidus* Fieb. and *P. alnicola* D. and S., the last two from ash and alder respectively. At Gaitsgill, on spruce, I found *Atractotomus magnicornis* D. and S., and *Lygus rubricatus* Fall. in numbers, and *L. cervinus* H. S. sparingly.

One or two outings in September in quest of water-bugs yielded *Gerris odontogaster* Zett., *Corixa venusta* D. and S., *C. præusta* Fieb., *C. fossarum* Leach, *C. distincta* Fieb. and *C. falleni* Fieb., all from one pond at Cumwhinton, with numerous beetles, the best being *Hydroporus pictus* F., *H. assimilis* Pk., *Cælabius 5-lineatus* Zett., and *Laccobius biguttatus* Gerh. At Durdar, in October, *Hydroporus obsoletus* Aub. and *Agabus paludosus* F. occurred in a little stream with a swarm of *Platambus maculatus* L.

In Memoriam.

SIR ARCHIBALD GEIKIE.

WE take the following from *The Proceedings of the Royal Society*, issued January 1st: 'Archibald Geikie, in his eighty-ninth year, geologist, eminent alike as observer, writer and administrator. Joining the Survey in 1855, and retiring from it as Director-General in the first year of this century, his own pen has portrayed the life he led and the work he did in the Survey throughout that lengthly service. Widely travelled and an excellent linguist, he was foreign secretary



Sir Archibald Geikie.

Sir Archibald considered this was the best photograph of him ever taken.

of the Society from 1889 to 1893; then Secretary from 1903 to 1908, in which latter year he became President. During his Presidency fell the 100th Anniversary of the Society, and his organising power and social gifts enhanced the success of the commemorative celebration. A facile and happy speaker, he was also a productive author, and not only in geology, but in biography and in literary history; one of his latest services to the Society was the biographical notice he wrote of Sir Alfred Kempe, sometime his fellow officer in the Society. Elected Fellow in 1865, the seniority of the Fellowship had come to him two years ago. He had received many honours and distinctions, and his name was familiar to scientific circles the world over.'

In Memoriam.

ALFRED CLARKE (1848-1925).

ALFRED CLARKE, of Huddersfield, was born in the city of Winchester, March 7th, 1848. The son of a Wesleyan minister, his early days were spent in an atmosphere of good living which proved to be not conducive to the study of subjects outside the limits of religious training. Receiving no encouragement in the pursuit of scientific knowledge, for which he soon developed and always retained a thirst, and endowed with a nature which could brook but little constraint, he had recourse to illicit read-



ing in natural science. For works relating to chemistry he had a special inclination, and these he continued to study *sans* parental interest. After a period during which he was known to have been engaged in pit-sinking in the Forest of Dean, Gloucestershire, we hear of Clarke at Brighouse, in the West Riding of Yorkshire, where, in 1877, he acted as Secretary to the Rastrick and Brighouse Natural History Society. There he took advantage of close proximity to Huddersfield, and, at the old Mechanics' Institute, he enrolled as a student in chemistry under George Jarman, a figure well known to a bygone generation of teachers and chemists. Jarman was the first to organise classes in chemistry under the ægis of the old South Kensington Science and Art Department, and he was the prototype of the industrial research chemist of to-day. Jarman evidently saw promise in the work of young Alfred Clarke, who soon afterwards became his assistant. In the

latter capacity Clarke played an important part in the investigations of Jarmain directed towards finding a means of eliminating the 'burrs' from wool and woollen cloth, the presence of which constituted a grave impediment to progress in the staple industries of the district. This research culminated in the discovery of the wool carbonisation process, one of the landmarks in the technology of the heavy woollen industries; a process worked on an enormous scale in this country, in Belgium, and in America—it has been the chief factor in the rise and development of the industrial wealth for which the Spen Valley is now famous.*

A further association with Jarmain followed, this time as a manufacturing chemist, after which, Clarke launched out as a Consulting Chemist on his own account, settling down in a small laboratory in St. Andrew's Road, Aspley, within a few doors of the house in which he was destined to spend the remaining forty years of his life. Simultaneously, he was engaged in teaching chemistry in the evening schools of the district, a combination of work which could have left him little leisure time: a class at Brighouse entailed a four mile walk each way.

The turning point in Clarke's business life came in 1885. The passing of the Bankruptcy Act, in 1883, involved the appointment of accountants as trustees in bankruptcy, trustees under deed of arrangement, etc., and the proper performance of these duties often required special experience and an accurate knowledge of local conditions. Clarke, through his association with Jarmain, and from his own consulting practice, possessed this qualification in so far as it related to the woollen industries of his district, and he accepted the offer of a well-known Huddersfield firm of accountants to take over the temporary management of a local mill in financial difficulties. Possessing in addition to the necessary technical qualifications a caligraphy which must have put to the blush of shame many a desk-bred clerk, and having a 'good head' for figures, Clarke carried this through with the same thoroughness and despatch which characterised him in every job he ever undertook. At anyrate, it led to his services being retained by the accountants, now Messrs. Armitage and Norton, thus cementing a relationship only broken two years ago when he was retired in circumstances calculated to leave him without fear for the future.

For nearly fifty years Clarke was a dominant figure in natural history circles in the Huddersfield district, an area

* An excellent account of this work has been given by Clarke himself in a lecture on 'Wool Extraction,' delivered to the Huddersfield Textile Society in 1907, and printed in their Journal.

remarkable for its large number of local natural history societies and amateur naturalists of the type in which the Yorkshire Naturalists' Union had its origin. Following his official connection with the Rastrick and Brighouse Society, Clarke became an active member of both the Huddersfield Naturalists' Society and the Huddersfield Botanical Society. He was President of the former in 1886, and served as Secretary from October, 1891, to March, 1899. In 1892 he took an active part in uniting the Huddersfield Naturalist and Photographic Societies and was President a second time in 1900-1901.

From 1880 onwards Clarke devoted himself to the study of the fungi, and, in 1883, published a 'List of Fungi of the Huddersfield District' in the Annual Report of the Huddersfield Botanical Society. He infected the local societies with his own enthusiasm, and for a number of years was in great request as a lecturer on mycological subjects, and as a leader of their annual forays.

In 1888 he attended a meeting of the Yorkshire Naturalists' Union at Leeds, for its Fungus Foray at Bramham and Harewood, bringing with him from Halifax a friend whose interest in the fungi Clarke had recently aroused: this friend was Charles Crossland. From that year until 1924, when he was present at the Sheffield Foray, Clarke attended all the forays of the Yorkshire Mycological Committee, with the exception of only three. Ever since its constitution he had been a member of that Committee, and since 1917, in succession to Crossland, acted as its Recorder. It was at these meetings that he became known to a large circle of friends; although he had been a member of the Union for a period of 32 years, he rarely attended other meetings. Towards the success of these forays Clarke contributed very greatly. He it was who first introduced printed cards for the classification of the fungi placed on exhibition into their various groups. For a long series of years he furnished specimens from his own district, drawings of fungi, and photographs, which were always of interest to the beginner and the 'old hand' alike. He was one of the first photographers in this country to take up stereo-photography, and this he applied to the fungi with his usual success; he possessed an unrivalled collection of stereographs of these plants, which was nearly always available at Foray Headquarters. His drawings of fungi were excellent. Painstaking and precise in all his methods, he often obtained astonishing results by simple means, and was always ready to impart information as to methods which had proved useful to himself. His addresses were usually of a practical nature; for instance, in 1903, 'A Demonstration of some Methods of Preparing Illustrations of Fungi'; in 1902, 'The Use of Photography in the Study of the Fungi,' while, in 1912, his subject was 'The

Genus *Tricholoma*,' which was illustrated with drawings of a large number of species.* He always evinced the greatest delight in the discovery of rare species of fungi. Quite characteristic of his behaviour at such times is an incident unobtrusively chronicled in a report by A. E. Peck, 'Mycological Notes from Scarborough,' † which records the discovery of *Cordyceps capitata* Fr. at the Spring Foray in 1915: 'Mr. Clarke subsequently circulated to members from his portfolios drawings and notes on *Cordyceps capitata* made respectively by Bolton (1786) and Sowerby (1803).' As a field mycologist Clarke has had few equals in Yorkshire.

From his earliest mycological days Clarke enjoyed the friendship of both Worthington G. Smith and M. C. Cooke. From 1888 Masee and he were great friends and constant correspondents. Dating from the same year, Clarke and Crossland were almost inseparable; the distance between their two homes at Huddersfield and Halifax respectively, was a mere stroll to men accustomed to botanising over wild and extensive tracts of Pennine moorland, and Crossland's death at the end of 1916 was acutely felt by Clarke, who had watched with not a little pride the progress of his former protégé. The late Thomas Hey, of Derby, was another of his friends, and for a number of years one or the other conducted the Annual Foray of the Derby Railway Natural History Society. He was present at the historic foray at Selby, in 1896, when the British Mycological Society was founded, and he was one of its first members.

Clarke was responsible for the discovery of many species of fungi new to the county of Yorkshire, and of two new to science—*Belonidium Clarkei* Mass. et Crossl. and *Symphosira parasitica* Mass. et Crossl. He had for some time been engaged upon a revision of Masee and Crossland's 'Fungus Flora of Yorkshire' with a view to incorporating the additions of the last twenty years.

Retirement in 1923 brought the opportunity of pursuing

* Since this was written, Dr. T. W. Woodhead has drawn attention to an item of correspondence which has come into his hands, and in a much more authoritative way it emphasizes what has been said with regard to Alfred Clarke's capabilities in the delineation of the fungi. This is a letter addressed to Clarke by the late Dr. M. C. Cooke, written so late in the latter's life as July 23rd, 1911. Clarke had sent a number of drawings to Cooke for his advice and criticism. Cooke, in the course of a long and detailed reply in which he comments on each of the drawings, says 'I don't see anything in which you lack instruction. Your style is what I should call *natural* or artistic—in distinction from the *diagrammatic*. I have nothing but commendation for your figures They are far superior to some published plates which I have seen in my time, and equal to the best.'

† *The Naturalist*, 1915, p. 224.

his studies without interruption. It is an indication of the virility of both body and mind which he retained, that, at an age which he had then reached, he was able to throw his energies whole-heartedly into the furtherance of the policy adopted by Dr. T. W. Woodhead in regard to the use and arrangement of the material exhibited in the Tolson Memorial Museum. Within a short distance of his home, Clarke found at the Museum a congenial outlet for his botanical knowledge in the arrangement of the collections illustrative of local botany, systematic and economic. He had completed the cases of fungi, and was engaged on the flowering plants at the time of his death. The Museum will be further enriched by the addition of the valuable library which Clarke had acquired, together with his specimens and illustrations of the fungi. It was his ambition to have in his well-indexed cases coloured illustrations of all the larger fungi, and he would go to great expenditure of time and labour in his endeavours to make the collection as complete as possible. In this way he was occupied until almost the last moment. Upon the work-table at his home lay a borrowed copy of a recent issue of *Bull. Soc. Mycol. de France*. On opening this Journal after its return soon afterwards a sheet fluttered to the ground. It was a coloured copy of M. l'Abbe Voile's drawings of *Russula paludosa* Britz., so faithful a reproduction, indeed, that it was believed to be the original plate which had become detached. It could have been hardly dry ere the hand that held the brush would paint no more.

The end came with painful suddenness on January 20th. Three days later, represented by some who had been his colleagues of the Yorkshire Naturalists' Union, on its Mycological Committee, and of the Huddersfield Naturalists' Society, respectively, a great body of naturalists tendered its respects at the last ceremony in Edgerton Cemetery.

Several among past and present members of the Yorkshire Mycological Committee owe, or have owed, much to Alfred Clarke's readiness to proffer the helping hand, and one who climbed high was pleased to make this acknowledgement. Charles Crossland, in his Presidential address to the Yorkshire Naturalists' Union, delivered at Halifax, in 1907, said 'My own experience with fungi commenced in 1888 at the Bramham and Harewood Foray. Mr. Clarke was my first tutor.'*

Mr. Walter Clarke, to whom the writer is indebted for facts relating to his father's early life, and his sister, Mrs. Fisher, have the sympathy of all Yorkshire naturalists in their bereavement.

Dr. T. W. Woodhead has kindly furnished dates and other information, especially that referring to Clarke's association with local societies.—F.A.M.

* *The Naturalist*, 1908, p. 150.

JAMES E. BEDFORD, J.P., F.G.S.

(1856—1925)

WE regret to record the death of James E. Bedford, J.P., F.G.S., of Headingley, Leeds. The older members of the Yorkshire Naturalists' Union will remember the enthusiastic way in which he regularly attended the meetings and excursions of that Society, as well as of other similar societies in the county. The present writer first came into contact with him about thirty years ago, when Mr. Bedford was the



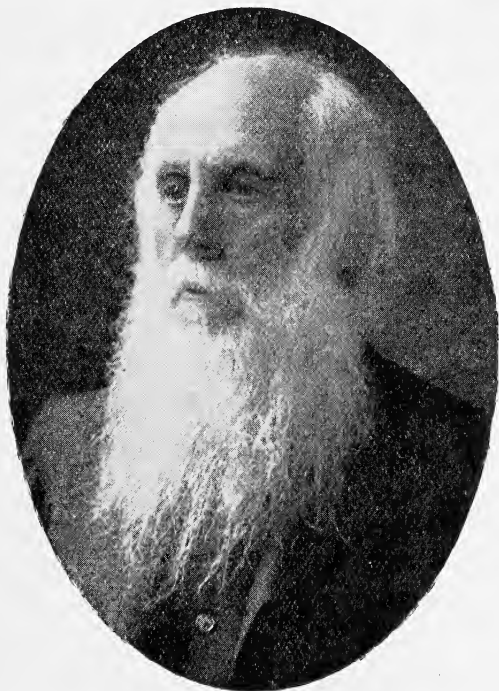
Secretary of the Yorkshire Geological Photographs Committee, and enthusiastically carried out his duties. He was keenly interested in Yorkshire Geology, and wrote occasional articles on the subject. He took a prominent part in the affairs of the Leeds Literary and Philosophical Society (as he did in many other institutions which had an interest in educational matters), and was at one time its President. The Yorkshire Geological Society, Yorkshire Numismatic Society and other similar bodies had the privilege of his help and membership. Mr. Bedford was a frequent contributor of valuable specimens to the Museum in Park Row, Leeds, and in addition to his scientific activities he was, as often happens with busy men,

able to devote time to municipal affairs, and eventually he became the Lord Mayor of his City. He also took an active part in religious matters. Having family connections in Hull, Mr. Bedford had an interest in that place, and when passing through frequently called and had a chat with the undersigned.—T.S.

W. WHITAKER, B.A., F.R.S.

(1836—1925).

WE are sorry to record the death of William Whitaker, F.R.S.,



who was born in London in 1836, and for the past quarter of a century has been the envy of many younger geologists for his apparent youthfulness and vigour. No meeting was too tedious nor excursion too long for William Whitaker, and his humorous and apt opinions in discussions at meetings of the Geological Society, the Sanitary Institute, or Natural History, Antiquarian or numerous other bodies with which he was connected, were always well appreciated. He was excellent company. His keen interest in maps and bibliographical matters brought him into touch with the present writer over a quarter of a century ago, and since that date, on

nearly all the numerous occasions upon which we met, Whitaker had a large envelope full of references, pamphlets, etc., likely to be of interest to me, a method he had of obliging many friends and Societies. He has contributed the lists of periodicals necessary for many of the Geological Survey publications; he has published accounts of the water supply of most of the counties of England in various *Transactions*; and so long ago as 1872 he wrote the first edition of the well-known Survey Memoir of the Geology of the London Basin. In 1847 he was appointed on the Geological Survey when only 21, and continued in that service until 1896, though he has done much work for them since. He joined the Geological Society of London in 1859; was its President in 1898-1900; in 1886 he was awarded the Murchison Medal; in 1906 he received the Prestwich Medal, and in 1923 he received the Wollaston Medal, the blue ribbon of British Geology. He was elected a Fellow of the Royal Society in 1887, and served on its Council. He was President of Section C (Geology) of the British Association at Ipswich in 1895, and was an honorary member of quite a large number of geological societies. His striking personality will be missed by many members of the British Association, the Sanitary Institute and many other societies, from the meetings of which he was rarely absent.

So long ago as 1907 he was the subject of one of the 'Eminent Living Geologists' series in the *Geological Magazine*.

He was not well at the Liverpool meeting of the British Association, and left before the meeting was over to return to his home at Croydon, where he died early in the present year.—T.S.

—:o:—

Little Owl near Harrogate.—A Little Owl was shot at, in mistake for a Woodcock, at Plompton on January 9th. It was only slightly damaged, and has been given to me alive. I have been expecting the species to appear in this neighbourhood for some time, but this is the first record.—R. FORTUNE.

Death's Head Moth near Darlington.—A fine Death's Head Moth was found dead on the road at Blackwell, near Darlington, on the Durham side of the Tees, by Miss Marjorie Nowers, on October 26th. The moth had laid most of her eggs, and a few were found on opening. The specimen is in the Darlington and Teesdale Naturalists' Field Club Museum.—JOHN E. NOWERS.

Some Scarborough Hawkmoths in 1924.—A local specimen of the Death's Head Hawk (*Acherontia atropos* L.) was brought to me in late May, having been found at rest on a beehive. Another was found in the town in October, and

one was sent to me from Bubwith in September. The species was evidently not uncommon last year. A male Eyed Hawk (*Smerinthus ocellatus* L.) was brought to me from Cayton in June; this species is usually rare in the Scarborough area. In September, Mr. A. T. Wallis reported having seen a Convolvulus Hawk (*Sphinx convolvuli* L.) at rest in a doorway in the town.—GEO. B. WALSH, Scarborough.

Yorkshire Ichneumons.—Some weeks ago I sent for determination to Mr. G. T. Lyle several ichneumons bred or taken by myself, and by the Rev. C. D. Ash. As Mr. Lyle was unable to examine them in time for the Annual Meeting of the Entomological Section of the Yorkshire Naturalists' Union in December last, I place them on record here.

BRACONIDÆ.

Apanteles congestus Nees. Cocoons, from a larva of *Hadena pisi* I picked up on the Waterloo Tip, Huddersfield, in July, were bred out by Mr. Lyle on October 30th last. Mr. Lyle says that all the specimens had black legs, a character which he had never previously seen in the species.

Apanteles pinicola Lyle. Bred by Mr. Ash from larvæ of *Thera firmata* from either Saxton or Everingham (he had larvæ from both localities) in June, 1923. This species was first bred, and described as new, by Mr. Lyle from larvæ of *Thera obeliscata* and *T. variata* from the New Forest, and it is interesting that it should now have been bred from another host of the same genus, in so widely distant a locality.

ICHNEUMONIDÆ.

Glypta annulata Bdg. Royd Edge, Meltham, August 25th, 1920.

Campoplex falcator Fab. Huddersfield. Bred, I think, from *Acronycta rumicis* on or about April 30th, 1921.

Anilasta carbonaria Ratz. Bred by Mr. Ash from *Thera firmata*, June 17th, 1923.

Anilasta notata Grav. Bred from cocoons found on Crosland Moor, Huddersfield, July, 1923. It is an abundant species on our moors, the cocoons being readily seen on the tops of the heather. Mr. Lyle has bred it from larvæ of *Fidonia atomaria* and *Anarta myrtilli*, and these are probably its hosts here, as both are common moorland species.

Ophion luteus Linn. Bred by Mr. Ash from *Chaerocampa porcellus*, April 24th, 1923.

GEO. T. PORRITT, Elm Lea, Dalton, Huddersfield,
January 7th, 1925.

YORKSHIRE NATURALISTS' UNION'S REPORT.

(Continued from page 61).

BOTANICAL SECTION.

Mycology (A. E. Peck) :—Mr. F. A. Mason has met with *Geaster rufescens* var. *minor* Persoon in the Leeds district and contributes an illustrated article thereon in *The Naturalist* for February.

Mr. Mason has attended most of the Union's Excursions, and his reports of the Fungi observed have appeared in *The Naturalist*.

The Naturalist for June contains an obituary notice and portrait of the late Sir Henry Hawley, Bart., who formerly attended our Fungus Forays and was an authority on the Pyrenomycetes.

The Fungus Foray of the year was held at Sheffield on the invitation of the Sorby Scientific Society. A report, with illustrations, appears in *The Naturalist* for November. The near proximity of the City to Headquarters on one side and the Derbyshire border on the other was anything but helpful to searchers for Yorkshire fungi, and, as had been anticipated, the records were fewer than usual.

Bryology (F. E. Milsom) :—In addition to work done at the general field meetings, two sectional meetings have been held, at Ingleton and Ramsden Rocks, near Holmfirth.

The distribution of *Orthodontium gracile* var. *heterocarpa* in South Yorkshire has been studied, and still further extended. Work on the distribution of the Sphagnaceæ in Yorkshire is also proceeding.

Two new hepatics have been added to the county list : *Alicularia scalaris* var. *procerior*, found at Ramsden Rocks, and *Plagiochila tridenticulata* found at Ingleton. Also another inland record for *Moerckia Flotowiana*, viz., at Ingleton, has been made. Other species noted during the course of the year will be found in the reports for the various field meetings.

Botany (J. Fraser Robinson and C. A. Cheetham) :—In Leeds skating was possible at the end of November last year, and then not again until the middle of March of this year. Frosts at night, with sunny afternoons, were general throughout this month. The only really warm spells, both of all too short duration, were in mid-June and early August.

As a result of the previous wet winter the plants of *Saxifraga oppositifolia* on Moughton Scar (where it is at a relatively low altitude) suffered severely, and on 16th March last, most of them were brown and withered, only occasional plants showing blooms. Throughout the year, however, the vegetative growth of this and other species of Saxifrage has been good, and on 13th September, *S. oppositifolia* seemed in a very healthy condition, one plant being actually in flower.

Notwithstanding the cold spring already referred to, Hawthorn blossom was seen in May, which is not usual in the north-west of the county ; but generally over the north of England there was not a great display of Hawthorn blossom anywhere, except in quite sporadic patches, and this is rather puzzling ; for in long hedgerows, which in ordinary years would show blossom on all or most of their component shrubs or trees, this year it was only in individual trees or patches thereof that the normal amount of blossom was approached. With the solitary exceptions of Mountain Ash and the less conspicuous Holly, both of which flowered very copiously in late spring, none of the other species of shrubs and trees in this respect seemed to be above the average, or perhaps quite up to it.

Consequently the same remark almost naturally applies to the fruiting this season, which might be put, on the whole, as only patchy, this being due probably to the uncertain weather at the time of flowering.

Of about thirty trees and shrubs recently reported on by widely separated Yorkshire observers, the fruit crop of 1924 seems, on the whole,

to fall somewhat below the average. The Mountain Ash is the chief exception, a full or very full crop being reported, and this was conspicuously evident in October in North-east Yorkshire at Thornton and Newton Dales and their tributaries. Other species with very fair or good fruitage are Alder, Elder, Wild Service, Wild Rose (particularly of the *Villosa* group), Holly and Hazel, of which nuts with fully-sized kernels were gathered near Goathland (North Riding) on 12th September. Respecting the bramble the reports are conflicting, some saying 'good crops,' others 'poor,' but raspberries were prolific and ripened well in most parts. Few crab-apples (*Pyrus malus*) have been seen anywhere this autumn; but orchard crops of apples and pears are good in many places; whilst those of the Pruni, *Prunus spinosa* with var. *macrocarpa*, the Sloe, are very fair.

Cultivated varieties of plums in many places have quite good crops. Of the larger trees of the hard wood type, only broad-leaved Elm, Birch and Beech have really much fruit, while those of Oak, Ash, Sycamore, Horse Chestnut are distinctly poor in quantity. If any exception might be made, the writers of this report would make it for *Quercus sessilis* (vel. *Q. sessiliflora*), which in the dales near Goathland is fairly well fruited. In the much lower lying East Riding area, particularly in the Holderness portion, where the Oak flourishes well, but is almost entirely of the *Quercus robur* var. *pedunculata* type, the fruitage is certain not very plentiful, or with big acorns. Of the several others not specifically mentioned in the foregoing, the crop may be taken as considerably below par generally.

While no year's work in the field can scarcely be without new stations being added, for one species and another, it is pleasing to note that an outstanding and entirely new addition to the flora of Yorkshire this year is that of *Veronica hybrida* on Moughton Scar, where it was found in August by Mr. W. K. Mattinson, of Austwick. The plant is spread over a considerable area on a steep scar, and it is somewhat surprising that it has escaped notice so long. Or is it not one more piece of evidence of which Yorkshire Naturalists have had several of late years, that in making additions to any flora, local or otherwise, there is really no finality (!)—that we shall still find new things, if only we seek with thoroughness, assiduity and regularity.

The pages of *The Naturalist* show conclusively that Yorkshire botanists are still working. Mention need only be made to Professor Priestley and Miss Hinchliff's papers on Vascular Plants Characteristic of Peat. Mr. R. W. Butcher's paper on the 'Plankton of the River Wharfe,' and Mr. W. E. L. Wattam's papers on the Lichens of various districts, in addition to the excellent reports of the Yorkshire Naturalists' Union excursions by Dr. Pearsall and Mr. F. A. Mason.

GEOLOGICAL SECTION.

(W. S. Bisat and J. Holmes) :—During the current year, as in several past years, the Geological Section, together with other workers in Lancashire and Yorkshire, has continued the study of the goniatite zones in the Carboniferous rocks of the North of England. The result of the Easter meeting at Earby was fully reported in *The Naturalist*.

A goniatite-yielding exposure has been discovered at the top of the Pendleside Limestone north of Flasby Fell, which may possibly be the locality which furnished Phillips with many specimens. Also during the year the exact position of the *diadema* zone in the Gill Beck sequence has been determined. The presence of the officers of the Geological Survey in the field, re-surveying the Carboniferous rocks of Lancashire and the Huddersfield area in Yorkshire, is a happy coincidence, as the detailed re-mapping of the Grit areas has made it possible to estimate very closely the thickness of beds from zone to zone in different localities,

and some striking variations in thickness have been recorded. A notable example is the south-westerly thickening of the Upper Grits and Lower Coal Measures of Lancashire (see *Summary of Progress of the Geol. Surv.* for 1923, Appendix II., pp. 150-157 and Fig. 14). The 1923 Summary is indeed full of new details of the Carboniferous sequence in Yorkshire, Lancashire, Cumberland, Northumberland and Scotland.

Large numbers of the zones found in Yorkshire have been identified in Germany by Dr. H. Schmidt, of Gottingen. The sequence of zones characterised here by *inconstans* Phill., *reticulatum* Phill. and its mutations, is found by Dr. Schmidt to occur in Germany also. Below *inconstans*, however, there appears to be a gap in the German sequence extending downwards until the equivalent of our Bowland Shales (the Culm) is reached. Indeed work in other areas in Britain where Carboniferous rocks are exposed suggests that we have in the Yorkshire-Lancashire-Derbyshire area a much more complete succession than is known elsewhere. It is hoped that the exposures below the zone of *inconstans* investigated by the Geological Survey at Todmorden, together with those discovered by Mr. Jackson near Edale, in Derbyshire, will amplify and extend our Gill Beck (Cowling) and Rough Lee exposures, and enable a complete faunal succession to be carried down to the Bowland Shales. At present, many isolated records are known from the beds below the *nuculum* zone; but these are difficult to correlate with certainty, and the bad state of preservation of most of the specimens prevents detailed diagnosis. Once one descends in the sequence below the *nuculum* zone a region is entered where all is doubt and hesitation, until when the upper part of the Bowland Shales is reached the zone of *E. pseudo-bilingue* is entered. Even here determinations are rendered uncertain by the bad state of preservation of the material available, and it seems possible that more than one species possessing *bilingue*-like habit occurs there. Much more field work is needed, both here and in the lower part of the Bowland Shales, before a complete mastery of the zonal sequence is attained.

It seems probable that Dr. Schmidt's detailed descriptions of material from the German Culm will prove helpful, especially when a comparison can be made with Father Waddington's fine collection from Dinckley and neighbourhood. A considerable step forward in the correlation of the northern and southern phases has been made by the discovery by Mr. Hudson of *Goniatites crenistria* in the Yoredales.

The Hull Geological Society has been engaged this summer in the investigation of the sub-Cretaceous clays exposed on the North Lincolnshire shore of the Humber at South Ferriby. By the aid of a grant from the Gloyne Research Fund excavations have been made, and fossiliferous material obtained. This work is still in progress, and so far the results, though inconclusive, suggest that the topmost clays exposed on the shore are of Upper Kimmeridgian age, thus indicating beds considerably higher than the Corallian Clays of Melton, near North Ferriby, on the Yorkshire side of the Humber.

Committee of Suggestions (C. A. Cheetham):—The pages of *The Naturalist* have given evidence of the progress of the work initiated by this Committee. Mr. W. H. Burrell has made a long and careful microscopic study of the débris found in Pennine Peat, made available to the student in a paper in the May number. Prof. Priestley and his students have continued their study of plants growing on Peat, and Dr. Woodhead and his students, with Mr. Francis Buckley, have thrown considerable light on the question of the origin of the Peat in the Huddersfield district (*Journ. Bot.*, October, 1924). If the recent decision of the British Association to investigate the Quaternary Peats of the British Isles is carried out, our knowledge of Peat should be greatly extended.

The meeting of the Committee in conjunction with the officials of the West Riding Rivers Board (*The Naturalist*, p. 248) will probably

stimulate the work of Rivers Investigation in the future, and we hope to see more interest taken in this subject in the coming year.

Coast Erosion.—On this subject there is nothing new to report.

Obituary.—We deplore the loss, through death, of six members who have been actively identified with the work of the Union, including a Past-President:—Sir Archibald Geikie, O.M., K.C.B., LL.D.; Sir Henry Hawley, Bart.; Dr. Robert Kidston, F.R.S.; H. Moore, Arnold Watson and A. Haydock.

British Association (T. Sheppard):—The only meeting of the British Association held in England this year was the Annual Conference of Delegates, at which your representative had the privilege of presiding. This was held in the Conference Hall at Wembley on July 22nd, during the Conference of the Museums Association, the various directors and other representatives of the Museums and Art Galleries throughout the country, and also some from the Dominions, being present. Professor J. L. Myres, M.A., F.S.A., gave an address on 'The Preservation of Sites, Natural and Historical,' which was ordered to be printed in the Report of the British Association. There was also a discussion on 'flags.' A vote of condolence was passed to the family of the late Sir William Herdman, the news of whose unexpected death being received towards the close of the meeting.

Soppitt Library.—Since the last report the following additions have been made, and our thanks are due to the donors for these contributions: 'Transactions of the Bradford Natural History and Microscopical Society,' 'Mollusca of the Bradford District,' presented by the author just before leaving this country for Australia; 'The Queensland Naturalist,' 'The One Hundredth Annual Report of the Whitby Literary and Philosophical Society, 1922,' 'Transactions of the Botanical Society of Edinburgh, 1922-3,' 'Transactions and Annual Reports for 1922-3 and 1923-4 of the North Staffordshire Field Club.'

During the year **The Naturalist** has been kept to its usual standard, and by the aid of several coloured plates has proved of more interest to the general reader. In addition to valuable contributions by an increasingly large number of writers, the readers of the journal, by means of the Notes and Comments, and Northern News items, have been kept familiar with current literature likely to interest them.

For many blocks and illustrations we are again indebted to Mr. T. Sheppard. Assistance has also been received from the London and North Eastern Railway Company, and from the various publishers, with the coloured plates.

BALANCE SHEET, November 24, 1924.

LIABILITIES.

	£	s.	d.
Amounts owing by Union—			
'Naturalist,' etc. ...	120	2	6
Subscriptions paid in advance ...	10	1	0
Life Members' A/c ...	139	13	0
'Hey' Legacy A/c ...	20	0	0
Balance, being excess of Assets over Liabilities ...	94	15	9

£384 12 3

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	£	s.	d.	£	s.	d.
Cash in Bank ...	211	1	5			
Cash in hands of Hon. Secretaries ...	0	16	2			
" Hon. Treasurer ...	2	14	8			
War Savings Certificates—						
£100 (Feb. 12/17) cost						
£77 10s.; present value, say ...	114	0	0			
£25 (Jan. 17/19) cost £19 7s. 6d.; present value, say ...	26	0	0			
				140	0	0
Subscriptions in arrears ...	48	1	6			
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				30	0	0

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Audited and found correct,

Nov. 27th, 1924,

ALBERT GILLIGAN, } Hon. Auditors.
J. DIGBY FIRTH. }

Investments:—

'Cheesman' Fund, £100 5% War Loan.

'Booth' Fund, £100 3½% Conversion Loan.

GEOLOGICAL SURVEY MEMOIRS.

WITH its characteristic energy and charming lack of consistency the Geological Survey continues to publish its valuable memoirs, some of which should be brought before the notice of our readers. Well bound in cloth, on fairly good paper, and with plates consisting of photographs reproduced by the half-tone process, with sixty-six sketches (maps, rock sections, etc.) in the text, has been published **Tertiary and Post-tertiary Geology of Mull, Loch Aline and Oban** (445 pp., 15s. net), the title page of which contains an ingenious attempt to include the names of a good proportion of the staff of the Survey without making the page appear to be too crowded; but in this it has failed. Dr. J. S. Flett, in his Preface, refers to the pioneer work of Dr. Harker, and gives a summary of the researches in that interesting Island, so far as the Tertiary and Post-Tertiary Geology is concerned; a companion volume apparently will shortly appear dealing with the older rocks. The Survey has also adopted an ingenious method of assisting a reviewer who may be disinclined to read the book he 'reviews,' by issuing a notice with the publication, from which we have extracted the following, as it gives an excellent summary of the valuable report:—'Mull is an "ancient volcano" which was active in Tertiary times, and has been reduced to a stump by erosion acting through long ages. In the periphery of the island lava-flows predominate, of which the island of Staffa furnishes a famous instance. Between the lavas beds of clay with well-preserved fossil leaves indicate the forest growths that clothed the slopes of the volcanic hills. In the centre of the island is found the heart or focus of the old volcano, showing a marvellous structure of ring-shaped and cone-shaped intrusions of many different kinds of igneous rock. To geologists this book will be of great interest as the most elaborate description of an ancient British volcano that has yet been published.' Most of the notes are initialled, so that if one is fortunate enough to be personally acquainted with the owners, one can place the correct amount of reliance upon any opinions expressed. The map to accompany the Memoir on the Island of Mull is one of the most complicated pieces of colour-printing that we have seen for some time, and the selection of the colours has been so carefully made that there is nothing displeasing to the eye, and the various rocks can be distinguished with ease. The map, Sheet 44, on the scale of one inch to the mile, can be obtained through the usual sources at the remarkably low price of 3s. From the same source has been issued **The Economic Geology of the Central Coalfields of Scotland**, Area VI., Bathgate, Wilsontown and Shotts with Braehead, Fauldhouse, Armadale and Harthill, by **M. Macgregor** and **E. M. Anderson** (iv. + 134 pp., 5s. net), with contributions by others. In this case the cover is of stiff cardboard, and along the back is a strip of brown cloth upon which the title is clearly printed in large letters. The volume is the seventh of a series referring to the Economic Geology of the Central Coalfields of Scotland, and 'deals in detail with the economic geology of the country stretching from Torphichen southwards by Bathgate and Blackburn to Wilsontown and Braehead, and extending in a westerly direction to Allanton, Kirk of Shotts and Forrestfield. With the exception of the Barren Red Measures all divisions of the Carboniferous Formation are represented, and the succession as proved by shaft sections and borings in different parts of the area is illustrated by three plates of comparative vertical sections. Full details are given regarding thickness and depth of the various coal and ironstone seams, the areas over which they are present, the occurrence of fossiliferous index-beds, the direction and size of the more important faults, and the minor folding affecting this part of the Lanarkshire basin.' With regard to the method of binding, the next four volumes are uniform, though different from either of those already referred to, and different again from the last two to be mentioned in these notes. The covers are of fairly substantial thick

buff-coloured paper, surrounded by the Royal Arms, and the title has evidently been arranged by a printer who has had an eye for effect, which is quite a pleasing feature of these particular Survey publications. The first of the series is an account of **The Geology of the Country Around Dartford**, by Messrs. Dewey, Bromehead, Chatwin and Dines (vi.+136 pp., 3s. net). The beds from the Upper Cretaceous to the Pleistocene deposits are described in detail, as well as various aspects of economic geology, etc. There are plates which are surprisingly well produced, that of the Micrasters from the Chalk being as good as anything that might be expected from, say, *The Journal of the Geological Society*. A companion volume is **The Geology of the Country Around Hertford**, by **Dr. R. L. Sherlock** and **R. W. Pocock** (vii.+66 pp., 1s. 6d. net). Naturally it deals largely with the gravels and similar superficial deposits which occur in the area around Hertford, St. Albans, Welwyn and the Lea Valley. There are interesting notes on the Chalk, and Dr. Sherlock gives Reports on the Microzoa in the Glacial Sands. **Summary of Progress of the Geological Survey of Great Britain and the Museum of Practical Geology for the Year 1923** (iv.+173 pp., 4s. net). This Record is now produced in this more or less respectable series, and we are not sorry to lose the familiar flimsy covering of previous years. A perusal of the volume gives an excellent idea of the ramifications of this important Government department, and makes one wonder how such reports are possible with the greater proportion of the working collections still nailed up with hoardings. Volume XXVIII. of the Special Reports on the Mineral Resources of Great Britain, which commenced during the war, deals with **Refractory Materials : Fireclays. Analyses and Physical Tests**, by **F. R. Ennos** and **Alexander Scott** (iv.+84 pp., 3s. net). After giving an introduction dealing with the mode of occurrence of Fireclays, etc., and Physical Tests, many analyses and statistics likely to be of service are quoted. In the next two Memoirs we are introduced to the type and general appearance of what seems to be the 'prehistoric' style of the Survey Memoirs, though the light-coloured cover is certainly stouter than the old ones, and another form of the Royal Arms decorates it, as also the title-page inside. In **The Geology of the Country near Brighton and Worthing**, by **H. J. Osborne White** (vi.+114 pp., 3s. 6d. net), the author describes the Wealden, Lower Greensand and Selbornian Beds; The Chalk; Eocene Beds and Superficial Deposits; and has notes on the Economic Geology. There are plates which give a smartness to the appearance of the volume, and illustrations in the text, though some of the latter unfortunately remind us very forcibly of the earlier Survey Memoirs. The author is thoroughly up to date, and has even included particulars of quite recent archaeological researches in the area. **The Geology of the Country Around Flint, Hawarden and Caergwrle**, by **C. B. Wedd** and **W. B. R. King** (viii.+222 pp., 6s. 6d. net) is similar in appearance to that already described, and most of the remarks made also apply to this volume. Messrs. Wedd and King, however, have a very different and much more complicated area to deal with, as it includes Silurian, Triassic and Glacial beds, while the greater proportion of the area is occupied by Carboniferous Limestone, Millstone Grit and the Coal Measures. All these are dealt with in great detail, as is also the question of the fire clays and water supply.

—: o :—

The question of The Khapra Beetle and its Influence on the Moisture Content of Malt in Store is an exceptionally important one from the brewer's point of view, and some notes on this subject by Mr. H. S. Taylor and Mr. F. A. Mason appear in *Bulletin No. 13* of the *Bureau of Bio-Technology*.

NEWS FROM THE MAGAZINES.

The subscription to *The Scottish Naturalist* has been reduced from 15/- to 12/6 per annum.

'Bridlington Wild Flowers' is the title of a couple of articles which appeared in the now defunct *Natureland* for 1924.

D. Marsden, in the 'Lincolnshire County List' (*Wild Flower Magazine*, January) thinks that *Carex Limosa* is a county record.

'Notes on the Nesting of the Short-eared Owl in Yorkshire,' by E. A. Armstrong and G. W. Phillip, are printed in *British Birds* for February.

The Marquess of Tavistock describes how the 'Queen Alexandra' became egg-bound and then laid an egg, in *The Avicultural Magazine* for December.

Open Air, 'the magazine for lovers of nature and out-door life,' has followed in the wake of a number of other journals recently, and has ceased publication.

The Entomologist's Monthly Magazine for January contains, among others, a note on '*Priobium eichhoffi* Seidl., a Species of Coleoptera New to the British List,' by Horace Donisthorpe.

The Selborne Magazine, No. 352, covering the period October, 1923, to January, 1925 (pages 169 to 184), has been published, and includes various items likely to interest Selbornians, as well as the Bird Sanctuary Committee's Balance Sheet.

An excellent coloured plate illustrating a paper on 'Aberrations of Lepidoptera from Northern Ireland,' by Thomas Green, appears in *The Entomologist* for January. The species illustrated are *Argynnis aglaia*, *Lycaena icarus*, *Euchloë cardamines*, *Melitaea aurinia* var. *hibernica*, and *Pieris napi*.

We learn from the concluding part of *The Irish Naturalist* that the Belfast Naturalists' Field Club is considering the advisability of issuing a monthly magazine of natural history, archaeology, and literature. This presumably will take the place of the journal which has just completed its thirty-third volume.

In *The Journal of the Linnean Society* (Botany), dated November 29th, G. Erdtman gives results of some valuable 'Studies in the Micro-palæontology of Post-glacial Deposits in Northern Scotland and the Scotch Isles, with special reference to the history of the Woodlands.' His results are principally achieved by examining the pollen present in the peat.

In some 'Archæological Notes' appearing in *Man* for January, by M. P. Burkitt (the precise purport of which does not seem quite clear), he advises 'Prehistorians interested in Upper Palæolithic Art' to be 'on the look out for a new find of a tiny statuette representing a mammoth, made apparently of a sort of sandstone, reddish in colour, from the loess of Moravia and Austria.' Without going so far afield, prehistorians are still on the look out for a promised memoir of a tiny statuette, representing a mammoth, made apparently of a sort of chalk, whitish in colour, from the east of England, which geologists aver is a part of an ammonite. We hope the Moravian-Austrian specimen is not of that ilk.

The Editor of *Discovery* in his December number begins well! He states 'One of the worst troubles associated with writing about war is that a large number of people who avoided their responsibilities during the war write hysterical letters to you about it. This leads to a natural avoidance of the subject. People do not like to be written to by a lot of well-meaning neurasthenics and a perceptible percentage of traitors, internationalised aliens and a general precipitate of the unfit. . . . In order to avoid disappointment, let me say here and now that I do not intend to answer any letters on this subject. Life is too short to worry about other people's complexes unless one is a professional psycho-analyst.' And he still wants new subscribers!

NORTHERN NEWS.

Dr. A. C. Haddon has been awarded the first Rivers' Memorial Medal for anthropological work in the field.

Professor J. Arthur Thomson writes on 'The Fox' in *The Journal of the Ministry of Agriculture* for January.

In Part XLIX. of Buckman's *Type Ammonites* are figures of *A. vitreus* and *A. hamiltoni*, both from Robin Hood's Bay.

With reference to the recent report of the burglary at one of the Hull museums, a London correspondent suggests it is a case of 'the biter bitten.'

We notice from the Minutes of a Yorkshire Library Committee that 'the Committee further considered the question of replacing one of the small pinnacles on the roof of the library building: *Resolved* that the pinnacle be not replaced, but that the opposite pinnacle be made to correspond with the remaining portion of the damaged one.'

We learn from the recent press that 'The vicar of St. Paul's, Llanelly, dug up in his garden a stone spear and arrow head, which the British Museum experts state are the finest relics of the Stone Age yet found in this country.' With all due respect to his reverence, we don't believe either that the specimens are the finest yet found in this country or that the British Museum experts said so.

From another paper (Feb. 8th) we gather that 'A Stone Age axe-head, believed by experts to be fifteen thousand years old, has been dug up in an Oldbury (Worcestershire) marl hole. It is believed to be of Welsh stone, and is to be placed in the museum at Birmingham Art Gallery.' Notwithstanding the 'experts,' again, we think the date given is 'grossly exaggerated.'

We have received a useful copy of 'Rules and Syllabus of the Leeds Naturalists' Club and Scientific Association,' for 1925, the Hon. Secretary being Mr. E. J. T. Ingle, 18 Stratton Street, Leeds. It contains a list of members, syllabus of excursions and lectures, names of the recorders, information relating to the boundaries of the Society's sphere of operation, a useful map, and library catalogue.

As already announced in the Annual Report of the Yorkshire Naturalists' Union, the death of Sir Archibald Geikie removes from the geological world one of its greatest ornaments. Our members will recollect that a few years ago he was President of the Union, his address being printed in this Journal for January, 1918, and in the same volume, page 57, appeared an excellent portrait, which Sir Archibald sent specially as he considered it the best one he had ever had taken. (See also page 78).

We have received from Mr. T. Petch, of Peradeniya, Ceylon, further evidences of his interesting studies among the Fungi. Reprinted from *The Annals of the Royal Botanic Gardens, Peradeniya* are Gregarious Flowering; *Musa Troglodytarum* L.; Thread Blights; Revisions of Ceylon Fungi; *Cassia Leschenaultiana* D. C.; *Agaricaceae Pleurospores Zeylanicae*; Ceylon Pink-spored Agarics. Reprinted from *The Transactions of the British Mycological Society, Studies in Entomogenous Fungi*, IV.; Some Ceylon Cordyceps; *V. Myriangium*.

At the Annual Meeting of the Yorkshire Naturalists' Union, held at Sheffield, Mr. Arthur Whitaker exhibited a case containing preserved larvæ of about two hundred species of British Macro-lepidoptera, also a collection of bats in which were not only specimens of all the British species (with the exception of the very rare Bechstein's bat), but also immature examples of many. In addition to these he showed a case illustrating unusual variations in the eggs of many kinds of birds due to lack of pigmentation, including blue unspotted eggs of the chaffinch, blackbird, missel thrush, spotted flycatcher, black-headed gull, lesser black-backed gull, snipe, arctic tern, curlew, etc., and unspotted white eggs of the blackbird, robin, sedge warbler, and meadow pipit.

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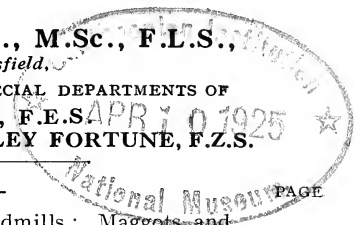
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THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL
PRINCIPALLY FOR THE NORTH OF ENGLAND.

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The Museums Hull;
and **T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,**
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YORKSHIRE NATURALISTS' UNION.

BRYOLOGICAL SECTION.

Easter Excursion, 1925.

Will members please note that Headquarters are changed to Mr. A. Camm, The Ingleborough Hotel, Ingleton, to whom applications for rooms should be sent. The same ground will be worked as from Austwick.

F. E. MILSOM, *Hon. Sec.*,
High Cross, Kirkburton,
Huddersfield.

GEOLOGICAL SECTION.

Easter Week-end Field Meeting at Clapham, April 10th to 13th, for the investigation of the shales exposed in the streams draining from Bowland Knotts to the River Wenning.

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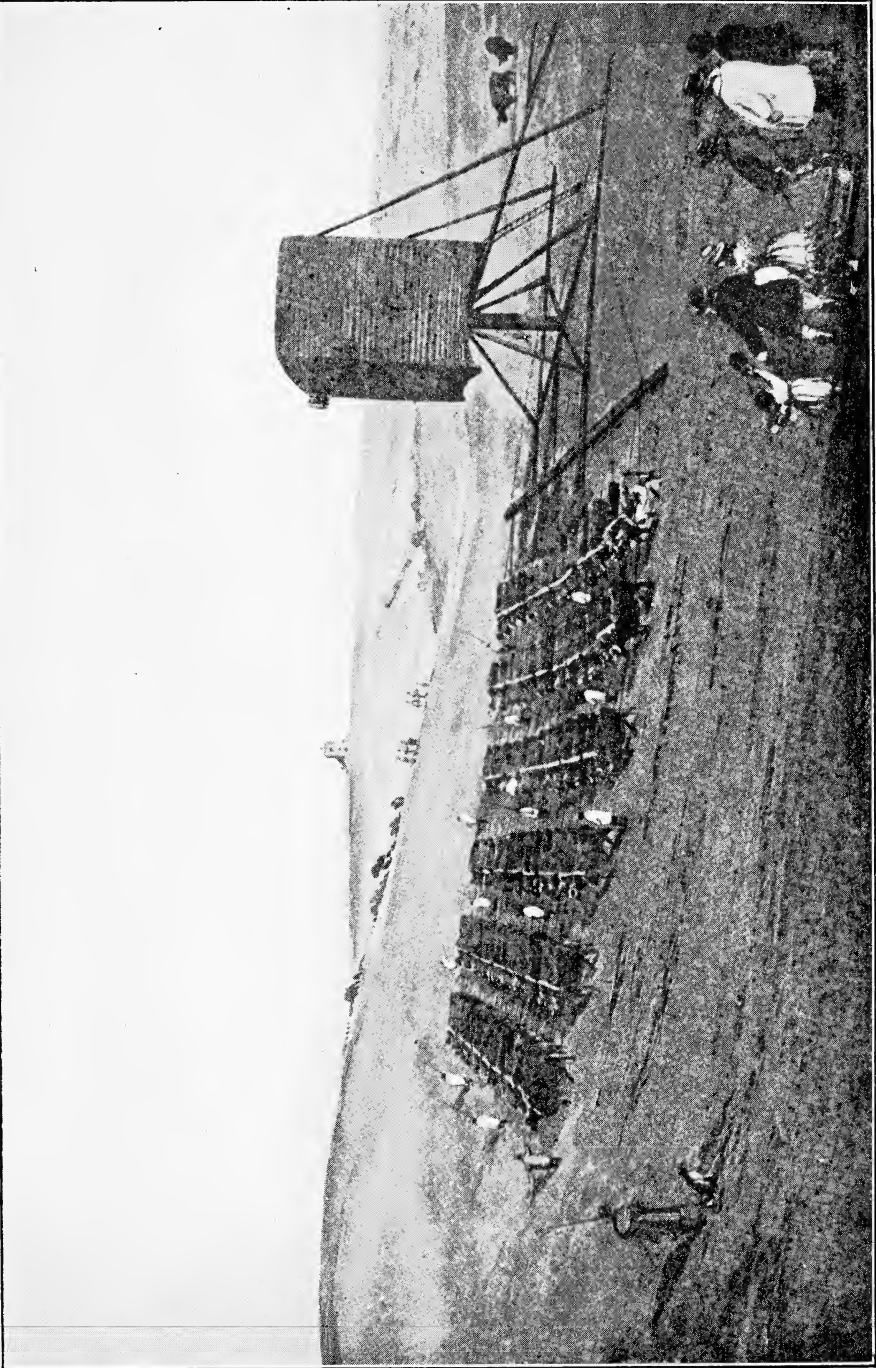
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Discovery. (Liverpool, 4to). 1891.
Derby Arch. and Nat. Hist. Soc. Part 21.
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Dublin Geol. Soc. Vol. I., pt. 1, 1830? ; Vol. VII., parts 1-3 (or complete Vols.). 1855.
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Removal of Regency Square Mill, Sussex, 1797.

NOTES AND COMMENTS.

OLD WINDMILLS.

Many besides naturalists will regret the disappearance from the countryside of windmills, especially those of the old peg-and-post type. One of the most instructive papers on this subject which we have seen in recent years, amply illustrated, appears in No. 2 of *The Brighton and Hove Archæologist*. In his paper on 'Our Windmills,' Mr. William Law illustrates and describes the various picturesque structures in Sussex, and traces their evolution from the earliest form to the latest. He permits us to reproduce herewith, Plate IV., and in this will be seen the method at one time adopted for removing a windmill from one position to another. It will be noticed that oxen are used for the purpose, Sussex being the only English county to-day in which these animals are used for draught purposes. Formerly the farmers in East Yorkshire regularly used them in this way.*

MAGGOTS AND MAN.

We understand from an elaborate review in *The Evening Standard*, of a shilling book written by a schoolboy in London, with the above heading, noticed at some length in *The Publishers' Circular* recently, that our ideas as to Evolution: The Origin of Life, etc., are to be revised, assuming that the opinions of the schoolboy in question are to be relied upon. According to him the beginning of animate nature was in the form of a maggot, the presence of which he accounts for, very simply, as that it 'came from a bad smell.' He goes on to say, 'Evolution means that everything is always becoming something else. Boys become men. Bicycles become motor-cars. Motor-cars become charabancs (*sic*). Eggs become Chickens. Broadly speaking, this is how Evolution acted on the maggots: Some of the maggots fell into the sea. These maggots became fishes. Some of the more enterprising fishes got on to the dry land and became frogs. The frogs became rabbits. The rabbits that were not good to eat became cats. The more warlike cats became dogs. The clever dogs became monkeys. The superior monkeys became apes. The aristocratic apes became ape-men. The ape-men became South-Sea Islanders. The South Sea Islanders became Red Indians. The Red Indians became Chinamen. The Chinamen became Huns. The Huns became Germans. The Germans became Frenchmen. The Frenchmen became Englishmen. And that's as far as we've got. The Englishmen is the highest animal in the world.'

* See 'Old Farming Methods in East Yorkshire,' *Hull Museum Publications*, No. 132, 1923.

THE EVOLUTION OF MAN.*

Dr. Elliott Smith brings together a number of interesting essays in this volume and pays particular attention to the views of Dr. Charles Hose. The author explains that his addresses will 'perhaps elucidate the general principles, without which most of the excellent works dealing with various aspects of the study of Man are apt to be very bewildering to the student. At the present time there is no book that explains these general principles in the only logical way they are susceptible of interpretation, namely, as an historical inquiry into the circumstances of Man's origin and descent. It is essential that the student should aim at understanding man's pedigree: for until some clear conception of the sequence of changes through which the ancestors of the Human Family passed to their progress toward the attainment of Man's estate it is useless to attempt to understand how the distinctively human powers of intelligence emerged.'

THE CHARACTER OF RACES.†

This substantial volume from the Yale University describes the Character of Races as influenced by physical environment, natural selection and historical development, and pays particular stress upon the question of natural selection. The author devotes much space to a somewhat speculative account of man's evolution and migrations. An idea of the nature of his theme may be gathered from the titles of certain chapters, namely, Glaciation and the Supremacy of Europe; The Suppression of America; The Anomalies of Aboriginal America; The Asiatics who dwell in Tents; Jews, Armenians and Turks; Cycles of Chinese History; The Scourge of Famine; The Contrast between Greeks and Irish; and The Dispersal of the Northmen. The volume is illustrated by numerous maps and diagrams, and has a long list of references and a good index.

A HISTORY OF BRITISH EARTHQUAKES.‡

Dr. Charles Davison has long been known as our authority on British Earthquakes, and in the present volume has brought together the results of thirty-five years' researches. In it he has compiled a catalogue of all known British earthquakes, has traced the zones in which the greatest changes have recently occurred, in which the forces are yet alive, and discovered some of the laws that rule the growth of the forces.

* By G. Elliot Smith. London: Oxford University Press, viii.+159 pp., 8/6 net.

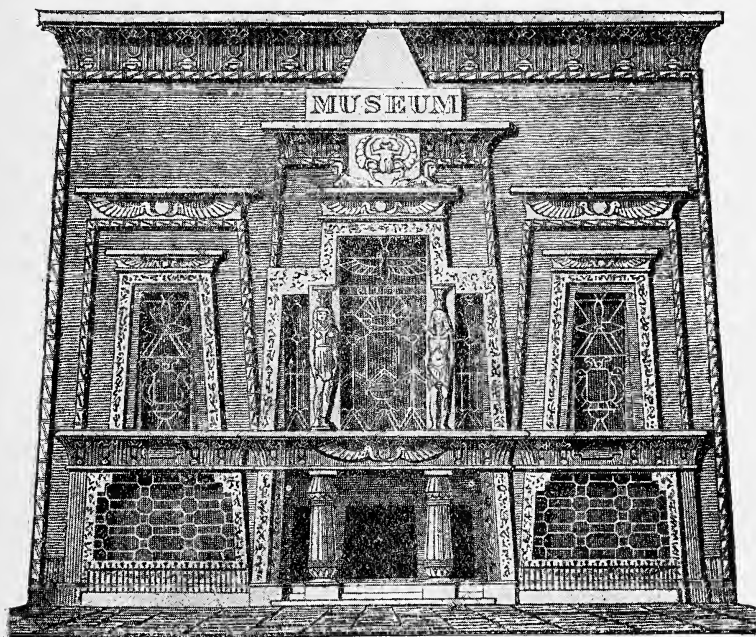
† By E. Huntington. London: Charles Scribner's, Sons, xvi.+393 pp., 25/- net.

‡ By Charles Davison. London: Cambridge University Press, xviii.+416 pp., 25/- net.

Dr. Davison considers that the study of British Earthquakes commenced in 1750, when Dr. Stukeley described that 'Year of Earthquakes,' there being then five notable shocks in England. The volume is wonderfully well illustrated, and portions of it are familiar to regular readers of *The Geological Magazine* and other technical journals. The author and the publishers are to be congratulated on bringing these scattered observations together.

EARLY MUSEUMS.

The Australian Magazine, edited by Dr. C. Anderson, is



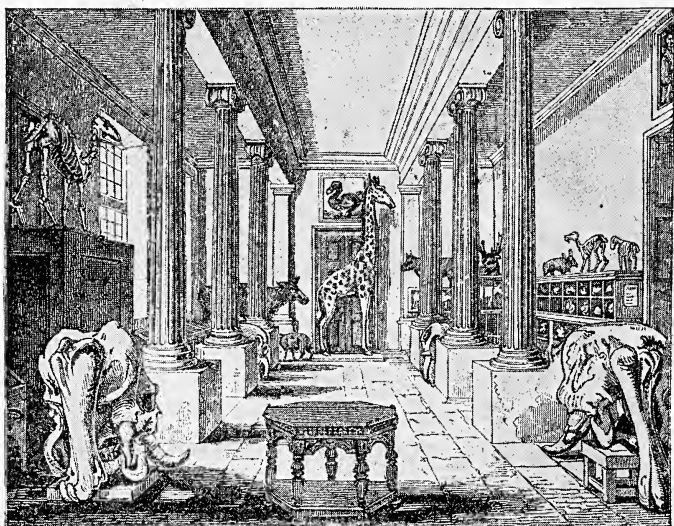
Bullock's Museum, Piccadilly.

excellently prepared and illustrated, and gives English Museum Curators a good idea of the activities of our friends in the antipodes. In No. 3, Vol. 2 of that publication, Mr. Tom Iredale gives an interesting account of Museums of the Past, which is illustrated by a number of quaint blocks, two of which we are permitted to reproduce.

COOK'S VOYAGES.

'The rapid growth of the natural history museum in the English-speaking world in the early years of last century is almost entirely due to the impetus given by Cook's Voyages of Discovery. When Captain Cook accepted the leadership

of the expedition to observe the transit of Venus, he was undoubtedly ambitious of discovery, but probably little anticipated the results of his voyages. The Linnean age had just blossomed, but it might never have borne fruit had it not been for the achievements of Cook's companions, including a pupil of Linné. Joseph Banks, a man of wealth, young and enthusiastic, obtained permission to accompany Cook, and selected as his mentor a very learned scientist, Dr. Carl Solander, a favourite student of Linné. Banks also had with him a staff of artists, who made paintings on the spot of the specimens obtained. Although Banks and Solander were mainly interested in botany, they made huge zoological



Interior of the Ashmolean Museum.

Note the Dodo behind the Giraffe, the only specimen known to have been in a British collection.

collections, and, as Banks paid all the expenses of himself and his staff, all the collections were his private property, which, upon his return, he freely gave to private individuals, who were fully appreciative of their value.'

OTHER MUSEUMS.

'The British Museum was practically a new institution, and being a novelty it had to compete with private collections, a stage long since passed. . . . Thoresby, of York, attempted to emulate Ashmole with a collection, but he was weak on the natural history side, a most valued possession being the leaf of a pineapple. Grew's collection, left to Gresham

College, and of which a catalogue was published, is of little interest to us, nor is Courtin's (later Charleton), but these lead us up to Sloane.'

EXIT 'NATURELAND.'

In April, 1922, we drew attention to two new natural history publications of the excessively popular type, and regretted that, in our opinion, they did not appear to fill a real want; nor could we quite judge the class of reader catered for by the publications. One of them, *Natureland*, has ceased publication, the regrettable feature in connection with which is that, assuming it has contained important scientific information during its brief career, its early demise makes the work exceedingly difficult to refer to, as few libraries will keep it. In our own case we have been unable to see or purchase the last part issued for October, 1924.

NOT W. PERCIVAL KAY PIKE ROBINSON?

'Many of our most respected and intelligent authors spend half their time during the spring and summer crouching in the grass or hiding in hedges or sitting in the tops of trees for the sole purpose of observing the beatified existence of the animal world. In the winter time, when the trees and hedges are bare, and it is no use sitting in them, they sit in quagmires amongst the reeds, hoping that the sight of a duck or a bittern may be vouchsafed to them, or that a water-vole may come and gambol near their boots. No hardships or privations are sufficient to deter them from this rite. Rising before dawn on the coldest days, they cook a hasty breakfast and go out into the marshes to prostrate themselves in front of a teal.'—*Punch*, February 11th.

£250,000 GIFT FOR EDUCATION.

The public announcement of the gift of £250,000 by the Rt. Hon. T. R. Ferens towards a University College for Hull reminds us to what a large extent the people of that city are depending upon private assistance in connection with its educational institutions. At the present time a new Art Gallery, costing something like £90,000, together with its site in the centre of the city, is the gift of the same gentleman. He has presented over £11,000 towards pictures for the permanent collection, without which the probability is the present Art Gallery in the City Hall would not have existed. Other gifts of Mr. Ferens include over £9,000 for the site for a new Technical College, amounts set aside for scholarships, playing fields, almshouses, boating lake, etc. The site and building for the Museum of Fisheries and Shipping at Hull were the gift of the late Christopher Pickering; the Mortimer Collection of Prehistoric Antiquities and Geology was purchased for the city by Colonel Clarke; the restoration of the Wilberforce

Museum and its valuable oak chimney pieces, etc., was possible through the generosity of Messrs. Francis and Arnold Reckitt, Sir Walter Cockerline, Messrs. Charles and James Downs, and others; and the New Commercial Museum has been decorated, heated, lit, furnished and fitted up almost entirely by the generosity of various Hull business firms.

GEOLOGICAL SOCIETY AWARDS.

The Geological Society of London has made the following Awards of Medals and Funds: The Wollaston Medal to Mr. G. W. Lamplugh, in recognition of his researches 'concerning the mineral structure of the Earth,' especially in connexion with Stratigraphy and Glaciology; the Murchison Medal, together with a sum of Ten Guineas, to Dr. H. H. Thomas, as an acknowledgment of the value of his researches on the Petrology of the British Isles; the Lyell Medal, together with a sum of Twenty-five Pounds to Mr. J. F. N. Green, in recognition of the value of his researches among the older rocks of the British Isles; the Bigsby Medal to Mr. C. W. Knight, as an acknowledgment of his eminent services to Geology, and more especially of his work on the pre-Cambrian rocks and on the metalliferous deposits of Ontario; the Balance of the Proceeds of the Wollaston Donation Fund to Dr. A. Brammall, in recognition of the value of his mineralogical researches on the constitution of the West-of-England granites; the balance of the Proceeds of the Murchison Geological Fund to Dr. A. E. Trueman, in recognition of the value of his researches on the Palæontology of the Invertebrata; a Moiety of the Balance of the Proceeds of the Lyell Geological Fund to Dr. J. A. Thomson, in recognition of the value of his researches on the Petrology and Palæontology of New Zealand; and to Dr. W. A. Richardson, in recognition of the value of his researches in Petrology. We should like to congratulate a past-president of the Yorkshire Naturalists' Union on the honour he has received.

ZOOLOGICAL LITERATURE.

At a well-attended meeting of British practical Zoologists, recently held in the rooms of the Zoological Society of London, under the chairmanship of Mr. Tate Regan, Dr. G. A. K. Marshall gave an excellent account of the work British Zoologists are doing in preparing a summary of current zoological literature. Among those who spoke on the subject were Prof. Gamble, Sir Sidney Harmer, Prof. MacBride, Prof. F. Balfour Brown and many others. Eventually the following resolution was passed, unanimously:—'This meeting of British Zoologists is of opinion that it is in the highest degree desirable that an effort should be made to extend the system of publishing comprehensive abstracts of zoological literature, and we

desire to place on record our great appreciation of the work that has been done to this end by the American Committee for "Biological Abstracts." We are, however, also of opinion that the scheme that has recently been submitted for our approval is open to serious objection in various directions.

OBJECTIONS.

Only some of these need be mentioned, viz.:—(1) The magnitude of the work involved appears to have been underestimated; (2) The financial arrangements so far made public are obviously quite inadequate for the purpose, which is a most serious point. It would be folly to assume that any publication of abstracts in pure science can be made self-supporting, and no scheme of this kind should be put into operation until satisfactory arrangements have been made for some permanent endowment. (3) The proposal to publish the abstracts of the whole of biological literature in a single journal is unsatisfactory; such a journal would be extremely cumbersome and highly inconvenient for all classes of workers. Bearing in mind the probable great increase of literature in the future, a much sounder plan would be to institute separate journals dealing with convenient sections of scientific work. (4) The abstracts will be very much shorter than those now being published in this country, and this brevity will seriously detract from their value to most workers. (5) The estimates for indexing are entirely inadequate. (6) No provision has been made for the utilisation or co-ordination of the various biological abstracting organisations that already exist in this country, and deal adequately with several branches of science; apparently it is proposed to re-duplicate their work, but in a less useful form. In the circumstances we consider that this scheme requires drastic revision.'

PARLOUS AND UNSAFE FOUNDATIONS.

In *Man* for February, Mr. J. Reid Moir quotes Mr. Miles Burkitt, who states, 'The problem of how far Solutrean implements occur in England has long exercised prehistorians. The laurel leaf is by no means a typical tool, unless it is found stratigraphically in Upper Palæolithic deposits, or associated with quarternary fauna. Single tools, especially when they are not massive, easily get displaced, sometimes to considerable depths, and a laurel leaf found isolated may be almost any date from Solutrean to Bronze Age times.' To this Mr. J. R. Moir adds:—'Now, this statement of Mr. Burkitt's is, to me, in the highest degree disturbing, as if a "landmark" in prehistoric archæology like the Solutrean blade is to be cast aside as of no typological value, then the very foundations of the edifice we are all helping to build are indeed in a parlous, and unsafe, condition. I, therefore,

made haste to refer to the works of some well-known authorities in order to see whether they share my friend's disquieting views on the Solutrean laurel leaf implement—and to my great relief I found that they do not.' Personally, we have considered for some time that the edifice which 'prehistorians' have erected was 'parlous and unsafe,' and so long as experts of the type of Mr. Miles Burkitt and Mr. Reid Moir differ so widely in their views, students must feel themselves in a difficulty.

OPTICAL GLASS.

From a paper on 'Optical Glass,' appearing in *The Proceedings of the Royal Philosophical Society of Glasgow*, Vol. LII., we learn that: 'To the Rev. W. Vernon Harcourt, the first Vice-President of the British Association, who commenced experimental work about the year 1834, there is attributable the systematic investigation of a great variety of new types of glass. Harcourt investigated the effects of practically all the metallic elements known at that date. From Harcourt's work it is evident that he experienced difficulty in obtaining the requisite temperatures,' and he devised a hydrogen furnace, the construction of which was made possible by a grant from the Association. 'While the arrangement indicated would suffice for the investigation of colourless silicates, it cannot be regarded as at all suitable for the investigation of optical glass, owing to the necessarily very small size of the platinum pot employed, and to the impossibility of stirring the medium. Unless experimental melts are stirred, it is hardly possible to obtain pieces of glass, the optical constants of which can be measured with the necessary accuracy, and that difficulty was certainly experienced by Harcourt. The apparatus itself was designed and constructed by the engineer, Mr. Bryan Donkin.'

HALIFAX NATURALISTS.

We learn from the *Halifax Daily Courier* that 'at the recent annual meeting of the Halifax Scientific Society, over which Mr. H. Waterworth presided, Mr. J. H. Lumb, presenting the details of the year's work, gave the present membership as 223, and the average attendance at the various meetings as 50, commenting that the latter figure was a lower record than had obtained in any of the previous fifteen years. The distinction of honorary life membership had been conferred on Mr. Walter Emmott, a foundation member, and Mr. F. Barker, Secretary for twenty years. Nearly five thousand visitors attended the exhibition promoted for celebrating the Society's jubilee. The Treasurer, Mrs. Colledge, announced a balance of £13 in hand. Mr. Waterworth attributed the decreased attendance to the constant changing of the meeting

room. The usefulness of the Society could not be estimated by the number attending the lectures. Very satisfactory results had been achieved by the sections, which were in a healthy condition. The following officers were elected:—President, Mr. H. Waterworth; Secretaries, Mr. J. H. Lumb and Miss E. H. Lumb; Treasurer, Mrs. Colledge, L.L.A. At an exhibition of objects, several members provided microscopes and material for examination under them. The photographic section hung a fine array of prints, Mr. S. H. Hamer showed a portion of his collection of old coins, Mr. C. J. Spencer a number of fossils, Mr. H. Lawson and Mr. S. Tidswell botanical specimens, Mr. W. Eastwood cases of insects, Mr. W. R. Verity a couple of rare local birds, which, with books, stereoscopic and nature photographs, etc., were perused with profit.'

PICTURESQUE EUROPE.

Messrs. Hutchinson & Co., who have already produced excellent publications dealing with animal and plant life, etc., are now producing *Picturesque Europe* at 1/3 a part, with coloured and tinted illustrations of some of the most charming parts of that great continent. The first issue is a wonderful panorama of marvellous monuments, natural and artificial. The frontispiece is a coloured illustration of Pompeii, with Vesuvius in the distance, and whether pictures of mountain scenery, prehistoric carvings, cathedrals, vineyards, etc., all the numerous illustrations are equally fascinating.

FISHERY INVESTIGATION.

The Ministry of Agriculture and Fisheries has issued its 'First Report on the Young Herring in the Southern North Sea and English Channel,' in which Dr. W. Wallace deals with the distribution and growth of Larval and Post-Larval Stages, and Mr. J. N. Carruthers refers to the Water Movements of the North Sea in relation to the Geographical Distribution of Post-Larval Herring. The Report contains several valuable tables and diagrams. The only complaint we have to make is that for 84 pages the price of 13/- seems rather high, and will probably interfere with the large circulation of the report among those concerned in the fishing industry, which seems a pity. The Report can be obtained from any of H.M. Stationery Offices.

DISTRIBUTION OF YOUNG HERRING.

From the Introduction we gather that: 'In the programme of the Herring Committee of the International Council the following items occur:—“4. Investigation of the younger stages of herring, especially in regard to their distribution.” “5. Investigation of the rate of growth of all stages” “7. Location of the spawning places, especially by the occurrence of the eggs or newly-hatched larvæ” The

present report constitutes the first contribution on the part of England to the supply of information required under these three heads. Part I. (now published) deals with the distribution of the larval and post larval stages, and is essentially an attempt to locate the principal spawning regions in the Southern North Sea and English Channel, and to trace, with the aid of concurrent data as to drift, the subsequent movements of the fry from the spawning areas to other parts of the sea and finally to various inshore waters where they appear as "whitebait." Part II. (held over for separate publication at an early date) will deal with the whitebait stages in the Thames Estuary and other inshore waters off the East Coast of England. In that part an attempt will be made, so far as the available material permits, to link up these later inshore stages with certain groups of post-larvæ in the open sea, in order to arrive at some conclusions as to where and when the whitebait herrings of a particular locality were spawned, and finally to trace their growth-rate up to the time of formation of the first winter ring in the scales. Part II. will, therefore, be a natural sequel to Part I.'

GROWTH AND DEATH.

At a recent meeting of the Linnean Society of London, Dr. G. P. Bidder introduced a discussion on 'Growth and Death': 'A water-borne organism may grow indefinitely, but swiftly-moving land-animals must maintain a relation between their weight and the cross-sectional area of their bones and muscles. Therefore, for each shape and habit of animal the cube of its length must bear a definite ratio to the square of its length; that is to say, that each shape and habit has its own size, from which it cannot vary greatly without loss of ability. Hence, although Plaice and Carp, like Sea-anemones and Banyan-trees, continue to grow until many times the age of their sexual maturity, and although we have no reason to suppose that they ever die, except by violence, the same could not be true of terrestrial and air-borne creatures of swift movement. Men and Plaice before puberty alike show additions to their weight in approximately geometrical progression for equal intervals of time, alike after sexual maturity they show an approximately arithmetical progression. In the plaice the annual increment (whether actually constant or not we cannot yet say) remains to a great age positive. In Man the arithmetical progression shows a difference with negative sign, and from 28 onwards there appears to be a constant net loss of protein material.' An interesting discussion followed, which is printed in No. 442 of the Society's circular.

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A beautifully coloured plate faithfully representing the bloom on the Sea Holly, a plant well-known to Yorkshire botanists, appears in Hutchinson's *Trees and Flowers of the Countryside*, Part XIX.

NOTES ON YORKSHIRE AMMONITES.

DR. L. F. SPATH.

I.—ON THE GENUS *OXYNOTICERAS* HYATT.

THE Hull Museum has lately been enriched by the important collection of derived Cephalopoda from the Holderness Drift; made and described by Mr. C. Thompson.¹ The writer has been favoured by Mr. T. Sheppard with a selection of these fossils, consisting of ammonites that seemed to him most interesting, and including the new species referred to in Mr. Thompson's paper. It is intended to discuss the more important of these in a series of palæontological papers, of which the present is the first; also to offer to Yorkshire geologists some suggestions as to those portions of the still largely hypothetical Jurassic succession that most urgently require checking in the field.

Beginning our series with the genus *Oxynoticeras*, which has been the subject of a number of important memoirs² as well as of a good deal of doubtful biological speculation, it may be mentioned that the commonest and largest Yorkshire species is *Oxynoticeras simpsoni* (Bean-Simpson) Blake sp.³ It includes one of the *Ox.* sp. nov. recorded by Mr. Thompson (p. 180) as having been named by Mr. Buckman, but the year previously the latter⁴ had refigured *Ox. simpsoni*, including it in the genus '*Aetomoceras*,' and comparing with it the ammonites figured by Dumortier.⁵ Pia,⁶ who, relying apparently on a comparison of the diagrammatic figures in Blake and Reynès,⁷ quoted '*Ox. simpsoni*, Simpson sp.' and '*Amaltheus simpsoni* Tate and Blake,' as separate species, considered Dumortier's ammonites to represent another new form. He also did not notice that they belong to different species, and failed to recognise the affinity of at least one of them (Dumortier's fig. 4) to the Yorkshire species.

Mr. Buckman,⁸ in 1918, while calling (on p. 311) *A. oxynotus* Dumortier a species quite different from *A. oxynotus* Quenstedt, referred (on p. 270) to the examples figured by

¹ *Quart. Journ. Geol. Soc.*, Vol. LXIX. (1913), pp. 169-183.

² Literature in Pia: 'Untersuchungen über die Gattung *Oxynoticeras*,' *Abhandl. K.K. Geol. Reichsanst.*, Vol. XXIII. (1914), pp. 3-6.

³ In Tate and Blake: *Yorkshire Lias*, 1876, Cephalopoda, p. 291, Pl. VIII., fig. 4. (The species had not previously been figured!)

⁴ *Yorkshire Type Ammonites*, Vol. I., 1912, Pl. LXVI.

⁵ '*Etudes Paléontol. sur les Dépôts Jurassiques du Bassin du Rhône*,' Pt. II., *Lias Inférieur*, 1867, p. 143, Pl. XXXIII.

⁶ *Loc. cit.* (1914), pp. 54 and 86.

⁷ '*Monogr. des Ammonites*,' 1879, Atlas, Pl. XLIX, figs. 1-7.

⁸ '*Jurassic Chronology: I.—Lias*,' *Quart. Journ. Geol. Soc.*, Vol. LXXIII. (1918), pp. 257-327.

Dumortier as 'species of about the *Gagaticeras* horizon.' It seems advisable to restrict Pia's '*Ox.* sp. nov. 33' to fig. 1 of Dumortier, with smaller umbilicus and sharper rim than *Ox. oxynotus*, and to re-name it *Ox. subinvolutum*, nom. nov., whereas Dumortier's fig. 2 can be referred to Pia's '*Ox.* sp. nov. 38,' based on Wright's *Amaltheus simpsoni*.¹ The smaller example figured by the latter author, with open and costate umbilicus, may now be taken to illustrate this new form (*Ox. eboracense* nom. nov.), and since Wright's original is apparently lost, an example in the Blake Collection (British Museum, No. C.18060) may be chosen as type.

The second *Ox.* sp. nov. recorded by Mr. Thompson and stated by Mr. Buckman to be perhaps *Ox. lens* Simpson sp. (a nomen nudum), is an immature form of the type of *Ox. subinvolutum*. Its crenulate keel is not of systematic importance; the young of *Ox. simpsoni* as well as of *Ox. oxynotum* often show this type of carina. Blake² had considered *Amm. lens* to be synonymous with D'Orbigny's *Amm. lynx*,³ but the latter is probably a *Metoxynoticeras* of the *jamesoni* zone (s.l.), and was recorded by Blake as occurring together with *Polymorphites trivialis*. The rare *Metox. oppeli* (Schloenbach),⁴ in error recorded by Blake as being probably from the *oxynotus* zone, like the Pabay specimen listed by the writer,⁵ also undoubtedly is confined to the *Polymorphites* beds of the *jamesoni* zone. Any Yorkshire geologist who attempts zonal collecting in these beds, and helps to clear up some of the difficulties previously⁶ mentioned, will be rendering a great service to stratigraphers and palaeontologists alike.

Ammonites retentus Simpson,⁷ which has a slightly different suture-line and a smaller umbilicus than other immature forms of the *simpsoni* type above discussed, has been made the genotype of a new genus (*Retenticeras*) by Mr. Buckman.⁸ The '*Arietites* sp. nov.' listed by Mr. Thompson was marked by Mr. Buckman: '*A. retentus*, Simpson is something of this style—not yet fully studied.' On account of its 'degenerate' suture-line, this example must be referred to *Ox. eboracense* rather than the similar *Eparietites collenotii* (d'Orbigny),

¹ *Monogr. Lias Ammonites*, *Pal. Soc.* (1881), Pl. XLVII, figs. 6-7 (restricted).

² *Loc. cit.* (1876), p. 292.

³ *Pal. Franç., Terr. Jurass.* (1844), Pl. LXXXVII., figs. 1-4.

⁴ '*Beitr. Pal. Jura.-und Kreideform.* N. W. Deutschl.' *Palaeontogr.* Vol. XIII. (1865), p. 161, Pl. XXVI., figs. 4a-c.

⁵ 'Liassic Succession of Pabay.' *Geol. Mag.*, Vol. LIX. (1922), p. 550.

⁶ 'Correlation of the *Ibex* and *Jamesoni* Zones of the Lower Lias.' *Geol. Mag.*, Vol. LX. (1923), p. 10.

⁷ 'Fossils of the Yorkshire Lias,' 1855, p. 84.

⁸ *Type Ammonites*, Vol. III., 1920, Pl. CLXVI.

probably its direct ancestor. If *Amm. retentus* really resembles the former, its generic separation from *Oxynoticeras* is scarcely necessary.

Ox. polyophyllum (Simpson) Buckman,¹ another Yorkshire species, is merely a costate *Ox. oxynotum*. Wright's example,² compared by Mr. Buckman with Simpson's species, is one of the many transitional forms between the two species, as Pia stated, and the suture-line, drawn by Wright rather inaccurately, is as close to that of *Ox. polyophyllum* as to that of the Gloucestershire example of *Ox. oxynotum* figured by Mr. Buckman in 1919.³ The corresponding variations of *Ox. lymense* (Wright⁴) all from one layer (Dr. Lang's bed 92⁵), but with differing ornamentation, proportions and suture-lines, could also easily be separated specifically, but fortunately there is very abundant material that defies the attempt at an artificial splitting-up of this well-defined gens. Wright's *Ox. oxynotum* or *Ox. polyophyllum*, moreover, was figured again by Mr. Buckman⁶ as *Ox. buckii* (non Simpson⁷), and the assumption of a *polyophyllum* above an *oxynotum* hemera⁸ is equally unjustified.

Ox. lymense has not yet been found in Yorkshire, but *Ox. albion* (Reynès), which was identified by Fucini⁹ with Wright's species, has been recorded.¹⁰ According to Dr. Lang's material, which he has kindly submitted to me for identification, and which will be described separately, it is associated already with *Crucilobicerias* (*densinodus* group) and *Deroceras* (so-called *armati*) and marks the upper Oxynoticeratan age (i.e., *oxynotus* zone in Oppel's sense), but in Dorset, the middle and lower portions of this, characterised by *Ox. oxynotum* and *Ox. simpsoni* (with *Gagaticeras gagateum*) respectively, are missing, as well as the upper part of the Asteroceratan age. Mr. Buckman doubted whether *Ox. lymense* belonged to this genus, but the young, to quite a fair

¹ *Yorkshire Type Ammonites*, Vol. I., 1909, Pl. VIII.

² *Loc. cit.* (1881), Pl. XLVI., figs. 4-6 ('*Amaltheus oxynotus*').

³ *Type Ammonites*, Vol. III., 1919, Pl. CXLIII.A.

⁴ *Loc. cit.* (1881), Pl. XLVII., figs. 1-3 only. The 'highly-ribbed variety of Pl. XLVIII., figs. 1-2, which is before me in a large series of typical specimens, may be separated as *Ox. wingravei* nom. nov.

⁵ 'Geology of the Charmouth Cliffs, Beach and Foreshore.' *Proceed. Geol. Assoc.*, Vol. XXV. (1914), p. 320.

⁶ *Type Ammonites*, Vol. III., 1920, Pl. CLXVB.

⁷ *Monograph of Lias Ammonites*, 1843, pp. 42-3; S. S. Buckman, *loc. cit.*, Pl. CLXV.A, fig. 1 only.

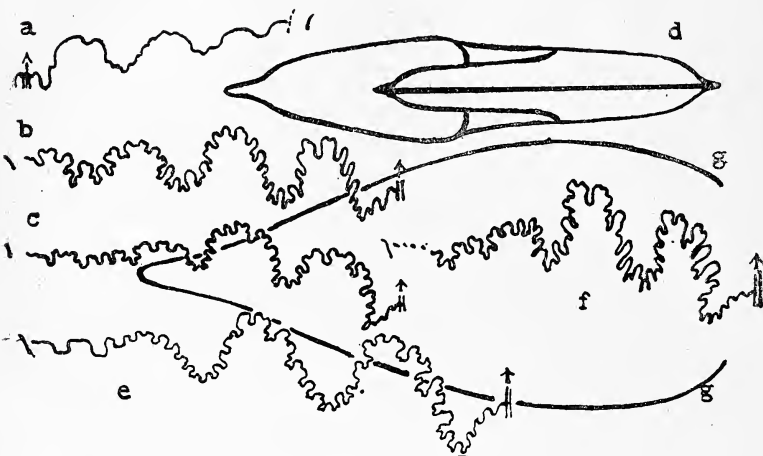
⁸ S. S. Buckman, *loc. cit.*, *Quart. Journ. Geol. Soc.*, 1918, p. 269.

⁹ 'Cefalopodi Liassici del Monte di Cetona,' Pt. I., *Pal. Ital.*, Vol. VII. (1901), p. 4, *Ox. italicum*, n.n. (= *Ox. lymense* mut. *italica* in Fucini), however, has quite a different suture-line.

¹⁰ 'Geology Whitby, Scarborough.' *Mem. Geol. Survey*, 2nd ed., 1915, p. 99. The lectotype of *Ox. albion* (Reynès, *loc. cit.*, 1876; Pl. XLV., figs. 21-22) is not related to *Ox. lymense*.

size, is very close to *Ox. reynesi* Pompeckj from the same bed (B.M., No. C.18726).

The true *Ox. buckii* and the similar *Ox. flavum* (Simpson) Buckman,¹ as I interpret them, belong to a group of forms characterised by a simple and 'inverse' suture-line, occurring in the same blocks as *Ox. simpsoni* and *Gagaticeras gagateum*.² A more compressed form, with a comparable 'Cheltonia'



EXPLANATION OF TEXT-FIGURE.

(a) *Oxynoticeras flavum* (Simpson) Buckman. Suture-line ($\times 9$) of an example from a block with *Gagaticeras* (L.F.S., No. 1869a). (b) *Ox. simpsoni* (Bean-Simpson) Blake sp. Suture-line (\times about 2) of an example in Hull Museum, recorded by Mr. Thompson as sp. nov. (c) *Ox. aff. simpsoni*. Suture-line ($\times 2$) of a specimen (B.M., No. C.17108) from the *Statterites* beds of Drake's Broughton, Worcestershire. (d, e) Sectional outline ($\times 1.6$) and suture-line ($\times 4$) of holotype of *Ox. eboraense*, sp. nov. (B.M., No. C.18060) from the Blake Collection. (f, g) Suture-line and outline whorl-section (both reduced $\frac{2}{3}$) of a magnificent specimen of *Ox. simpsoni*, of 190 mm. diameter, from the Bean Collection (B.M. No. 37998) with young *Gagaticeras* in body-chamber. Lower *oxynotus* zone (*simpsoni* hemera) of Robin Hood's Bay.

suture-line, in the Bean Collection in the British Museum (No. 37989) is labelled '*A. huntoni*.' Simpson's original of this species, however, figured by Mr. Buckman,³ is a *Tragophylloceras*,⁴ and the suture-line of the *Oxynoticeras*, figured by Blake as that of *A. huntoni*, also seems rather different, though equally 'inverse.'

¹ *Yorkshire Type Ammonites*, Vol. I., 1912, Pl. LV.

² L. F. Spath, Coll. Nos. 1869a, b, 1865.

³ *Type Ammonites*, Vol. III., 1921, Pl. CCXIX.

⁴ See also L. F. Spath, 'Development of *Tragophylloceras loscombi*.' *Quart. Journ. Geol. Soc.*, Vol. LXX (1914), p. 347.

Ox. limatum (Simpson) Buckman,¹ another doubtful small form, but probably not of the same group, like *Ox. flavum*, was considered by Blake to be a young *Ox. simpsoni*, and was compared by Mr. Buckman to Wright's '*Aegoceras slatteri*.'² The young of *Slatterites*, however, can be distinguished from the associated *Oxynticeras* by their thick '*Amoeboceras*' keel, already at a very small diameter. I hope to discuss this genus *Slatterites* more fully in a separate note, though it also belongs to the family *Oxyntida* Hyatt.

A '*Cymbites*' sp., lately recorded by Dr. Lee,³ probably from the *jamesoni* (not *ibex*) zone of Tobermory,⁴ was stated to be 'very much like *Amm. limatus* Simpson,' and a still more *Cymbites*-like form is *Oxynticeras arctum* (Simpson) Buckman.⁵ *Oxynticeras dennyi* (Simpson) Buckman⁶ also may belong to the same group. Mr. Buckman, on account of the presence of an auriculoid, compared this species to *Amm. auritulus* Quenstedt, which he later included in his genus *Gleviceras*. This late stock of *raricostatus* age can on no account be considered to be ancestral to *Oxynticeras*. It is probable, however, that a new name will have to be used for the dwarf offshoots of *Gleviceras* that correspond to the earlier *Cheltonia* (off *Oxynticeras*), but shew resemblance in shape to *Cymbites*.

It may be added that to judge by two small examples from the *jamesoni* zone in the Blake Collection (B. M., Nos. C.22074-5) the higher *Oxynticerates* commonly referred to the *flavum-limatum* group may be the young of *Amm. spheno-notus* Monke,⁷ for which the new genus **Hypoxynoticeras** gen. nov. is proposed. This has been recorded from Skye, with *Metoxynoticeras*, and comparable forms are in the British Museum from Dalby, Leicestershire, and Gretton, Northants. On account of the resemblance of their 'inverse' suture-lines to those of the similar species in the *simpsoni-gagateus* bed, no satisfactory classification of these small forms will be possible until the help of field workers in the Yorkshire Lias has been

¹ *Yorkshire Type Ammonites*, Vol. I., 1912, Pl. LVI, fig. 1 only.

² *Loc. cit.* (1882), Pl. L., figs. 1-8. *Slatterites primus*, n. nov., (= figs. 6-7 only), is not the young of *S. slatteri* (Wright = figs. 1-3 and 8), or of *S. mundus*, n. nov. (fig. 4 only), and these again are not identical with *S. obtusiformis*, n. nov. (= fig. 5 only).

³ In Lee and Bailey: 'The Pre-Tertiary Geology of Mull, Loch Aline and Oban.' *Mem. Geol. Surv. Scotland*, 1925, p. 90.

⁴ See L. F. Spath, *loc. cit.* (Pabay), 1922, p. 551. *Tragophylloceras* of the *numismale* group, common in the *caprarius* shales of Pabay, would appear to have been recorded in error as *T. cf. loscombi*, etc.

⁵ *Yorkshire Type Ammonites*, Vol. I., 1911, Pl. XXXVI.

⁶ *Ibid.*, 1909, Pl. VII.

⁷ 'Liasmulde von Herford in Westfalen.' *Verh. Naturw. Ver. Bonn.*, Ser. V., Vol. V. (35), 1889, p. 104, Pl. II., III., fig. 14.

obtained and zonal collecting throws fresh light on the inter-relations of the various assemblages.

Yorkshire lists of *Oxynoticeras* include also *A. alienus*, *A. complanatus* and *A. antiquatus* of Simpson. These nomina nuda ought to be ignored, and the last, from the description, certainly cannot be an *Oxynoticeras*. Its identification by C. Fox-Strangways,¹ with d'Orbigny's *Amm. charmassei*, is more plausible.

A form generally wrongly included in *Oxynoticeras* is *Amaltheus wiltshirei* Wright,² which has puzzled previous observers down to Pia.³ It is probably a derivative of the group of *Metoxynoticeras numismale* (Quenstedt⁴), with a whorl-shape more acute than that of Dumortier's *Amm. sæmanni*⁵ and a specialised suture-line. It may be separated as an independent genus, **Carixiceras** gen. nov. Wright's type is labelled 'henleyi zone,' but a gigantic though less well-preserved second example in the British Museum (C.17869) of over 400 mm. diameter was collected on Black Ven below the Belemnite Marls, and was believed by Dr. Lang to have come from the Belemnite Stone (i.e., *ibex* zone).

This high type also has not yet been found in Yorkshire, but the beds of the Liparoceratan age as those of the Polymorphitan and Derooceratan ages below, urgently require careful investigation.

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Little Gull at Whitby.—On the 12th of September last I saw a Little Gull feeding over the estuary at Whitby. Several persons were line fishing from the quay-side at the time, and the bird approached fearlessly, and during the short time I had it under observation it succeeded three times in stealing the bait (cockles) off a line thrown just as it touched the water without involving itself in trouble with the hooks. It was without the black head, characteristic of the breeding plumage, but had a small dark patch behind the eyes. It did not show the black band at the end of the tail, nor that across the wings stated to be characteristic of young in the first winter's plumage. When last seen it was flying up stream through the town.—ARTHUR WHITAKER, Dore, near Sheffield.

¹ *Jurassic Rocks of Britain*, II., Yorkshire, Tables of Fossils (1892), pp. 88, and 91.

² *Loc. cit.* (1881), Pl. XLVIII., fig. 3; (1882), p. 393 (wrongly quoted on plate as from *oxynotum* zone).

³ *Loc. cit.* (1914), p. 63.

⁴ 'Ammoniten des Schwäbischen Jura,' 1885, Pl. XXXVII., fig. 4 (lectotype).

⁵ *Loc. cit.* (1867), p. 154, Pl. XL., figs. 2-4.

HEMIPTERA FROM NORTH-EAST YORKSHIRE.

JAMES M. BROWN, B.SC., F.L.S., F.E.S.

WHILE staying at Sandsend during the later part of July and the early part of August, 1924, considerable attention was paid to the Hemiptera of the surrounding district. Although, during the last week of July the weather was very wet, rather more than one hundred and fifty species were obtained, the more interesting of which are listed below. Of these, six species of Heteroptera and four species of Homoptera are recorded for Yorkshire for the first time, several others have been taken very rarely, and many others are new to the vice-county.

I have again to thank Messrs. E. A. Butler and J. Edwards for confirming several of my doubtful determinations.

†=New to the County. *=New to the Vice-county 62.

HETEROPTERA.

- Coreus* (*Enoplops*) *scapha* F. The only previous Yorkshire records for this species date from sixty years ago, when it was taken at Hull and at Scarborough. After persistent searching among the vegetation on the cliffs at Sandsend, I was fortunate enough to discover a small colony, which included two or three adults and several immature individuals.
- Ischnorhynchus ericae* Horv. (*geminatus* Fieb.) Very common under and on *Erica*. I was unable to find any on *Calluna*. Aislaby, Sleights, Hutton-Mulgrave Moor.
- **Stignocoris pedestris* Fall. Under plants at the foot of the cliffs at Sandsend.
- Scolopostethus affinis* Schill. Plentiful on nettles, Sandsend and elsewhere.
- S. thomsoni* Reut. On nettles and at the roots of plants at the foot of the cliffs, Sandsend.
- S. decoratus* Hahn. Under *Calluna* wherever this plant was examined. Aislaby, Goathland, Hutton Mulgrave, etc.
- Derephysia foliacea* Fall. One obtained among grass on the cliffs at Sandsend.
- Tingis* (*Monanthia*) *cardui* L. Quite common on thistle heads, Sandsend, Robin Hood's Bay.
- **Nabis major* Costa. On the cliffs at Sandsend.
- N. limbatus* Dahlb. Plentiful and widely distributed among grass and on various low plants. Runswick, Sandsend, Robin Hood's Bay, etc.
- N. flavomarginatus* Scholtz. Common, but less plentiful than the last. Sandsend, Runswick.
- †*Temnostethus pusillus* H.S. An inconspicuous species obtained by beating old oaks, plentiful where it occurs. Sandsend. All were brachypterous.
- Anthocoris confusus* Reut., *A. nemoralis* F., and *A. nemorum* L. Common.
- †*A. sarothamni* D. and S. Plentiful on Broom at Aislaby.
- Tetraphleps bicuspis* H.S. (*vittata* Fieb.). On firs and larches, in Mulgrave Woods.
- Acomphocoris pygmaeus* Fall. Common on larches and firs, Egton Moor, Goathland, Mulgrave Woods.

- Microphysa pselaphiformis* Curt. One obtained by beating Scotch firs, Egton Moor.
- Pithanus maerkeli* H. S. Among grass on the cliffs, Sandsend.
- Stenodema (Miris) holsatum* F. Sandsend, Runswick.
- Trigonotylus (Megaloceraea) ruficornis* Geoff. Plentiful among grass, Runswick.
- Miris (Leptopterna) ferrugatus* Fall. Plentiful among grass on the cliffs near Kettleness and Runswick Bay.
- Monalocoris filicis* L. Common on bracken, Mulgrave Woods, Hutton Mulgrave Moor.
- Bryocoris pteridis* Fall. On ferns, Mulgrave Woods.
- Lopus gothicus* L. One found at the roots of plants on the cliffs at Sandsend. It has previously been recorded from Whitby. It seems to be rare.
- Phytocoris longipennis* Flor. Mulgrave Woods.
- **P. dimidiatus* Kb. Sandsend.
- P. varipes* Boh. A number of immature individuals among low vegetation on the cliffs at Sandsend during late July. Towards mid-August adults began to appear.
- P. ulmi* L. On hedge elms, near Sandsend.
- Calocoris sex-guttatus* F. This was by far the most noticeable species, occurring in large numbers together on nettles and other plants. Sandsend and elsewhere.
- C. norvegicus* Gmel. (*bipunctatus* Fabr.). Plentiful at Sandsend, Runswick, etc.
- C. roseo-maculatus* De G. On August 4th plentifully obtained by sweeping on the cliffs near Runswick. They occurred on the heads of the *Centaurea nigra*. A second visit was paid to the same spot three days later, when hardly a single specimen could be found. The first Yorkshire record was made last year at Filey (*The Naturalist*, 1924, p. 125).
- Plesiocoris rugicollis* Fieb. Common on willows. Mulgrave Woods, etc.
- Lygus pabulinus* L. Very common on nettles, Sandsend.
- L. contaminatus* Fall. Plentiful on birch, Sandsend. On hazel, Grosmont.
- L. viridis* Fall. On ash, Sandsend.
- †*L. spinolae* Mey. Obtained by sweeping, Grosmont. The most northerly record previously is Notts.
- L. pratensis* L. Commonly obtained by sweeping low plants. Runswick, etc.
- L. rubricatus* Fall. On firs, Mulgrave Woods.
- Capsus (Rhopalotomus) ater* L. Sandsend.
- **Macrolophus nubilus* H. S. This very delicate species occurs on brambles and *Stachys sylvatica*, Sandsend. Previously only recorded from the Sheffield district.
- Dicyphus constrictus* Boh. Sandsend, Mulgrave Woods, Robin Hood's Bay.
- D. epilobii* Reut. Plentiful at Sandsend on the cliffs, and at Saltwick Bay. It occurs commonly on *Epilobium angustifolium*.
- Campyloneura virgula* H. S. Obtained by beating oaks, Sandsend.
- Cyllocoris histrionicus* L. Also on oaks, Sandsend.
- Blepharidopterus (Aetorhinus) angulatus* Fall. Sleights.
- Mecomma ambulans* Fall. Plentiful at the roots of low plants, Sandsend, Aislaby.
- Orthotylus marginalis* Reut. Fairly plentiful on *Salix* sp. Mulgrave Woods, Kettleness.
- †*O. tenellus* Fall. On oak, Sandsend.
- **O. viridinervis* Kb. On elm, Sandsend.
- †*O. chloropterus* Kb. Plentiful on broom, Aislaby, Grosmont.

- †*Orthotylus adenocarpus* Perr. Occurring along with the last on broom, Aislaby and Grosmont.
O. ericetorum Fall. Common under and on heath. Aislaby, Goathland.
Heterocordylus tibialis Hahn. Common on broom, Aislaby and Grosmont.
 **Malacocoris chlorizans* Panz. On hazel, Grosmont, Goathland.
Macrotylus paykulli Fall. On *Ononis*, Sandsend, Robin Hood's Bay, Saltwick Bay.
 **Phylus palliceps* Fieb. On oaks, Sandsend.
 **P. melanocephalus* L. Also on oaks, more plentifully than the last, Sandsend.
 **P. coryli* var. *avellanae* Mey. On hazel, Sandsend.
Psallus variabilis Fall., *P. varians* H. S., *P. alnicola* D. and S. Were all obtained at Sandsend and elsewhere.
P. diminutus Kb. Mulgrave Woods.
P. roseus F. On willows, Grosmont, Runswick, Sandsend.
Atractotomus magnicornis Fall. On firs, Goathland and Mulgrave Woods.
Plagiognathus chrysanthemi Wolff. Plentifully obtained by sweeping low vegetation, Sandsend, Aislaby.
P. arbustorum F. Common on nettles, Sandsend.
Asciodema obsoletum Fieb. Common on gorse, Aislaby, Sandsend, etc.

HOMOPTERA.

- Philaenus spumarius* L. and *P. lineatus* L. Were common, Sandsend, Runswick and elsewhere. The dark vars. of the former, *leucophthalmus* L. and *leucocephalus* Germ., in Mulgrave Woods, and var. *prausta* Fab. at Runswick.
Megophthalmus scanicus Fall. Plentiful at roots, Sandsend, Robin Hood's Bay, and Runswick.
Euacanthus interruptus L. This striking species was one of the most obtrusive. It was exceptionally plentiful on the cliffs at Sandsend, Runswick Bay, and Robin Hood's Bay.
Batracomorphus lanius L. On oaks, Mulgrave Woods and Grosmont.
 †*M. cerea* Germ. Obtained by beating willows, on the cliffs near Runswick.
Idiocerus adustus H. S. On willows, Sleights and Grosmont.
I. confusus Flor. On willows, Grosmont, Runswick and Sleights.
 **I. albicans* Kbm. Sleights. The only previous Yorkshire record was made fifty years ago.
Agallia puncticeps Germ. Sandsend.
 **A. venosa* Fall. Runswick.
Acocephalus nervosus Schr. Plentiful in Mulgrave Woods.
A. bifasciatus L. Frequently occurring at the roots of heath, Runswick, Sandsend, Aislaby.
A. albifrons L. At the roots of plants on the cliffs, Sandsend and Runswick.
 †*Doratura stylata* Boh. Obtained by searching amongst the turf on the cliff top between Sandsend and Kettleless.
Athysanus sordidus Zett. Sandsend.
 **A. plebejus* Fall. Plentiful at Sandsend, Robin Hood's Bay and Grosmont.
 **A. lineolatus* Brulle. Mulgrave Woods and Runswick.
A. obsoletus Kbm. Aislaby.
Deltocephalus ocellaris Fall. Common, Aislaby, Goathland.
 **D. distinguendus* Flor. Sandsend, Aislaby, Robin Hood's Bay.
 **D. thenii* Edw. Sandsend.
D. pulicaris Fall. Sandsend, Robin Hood's Bay.
 **Thamnotettix prasinus* Fall. Common at Runswick Bay and Aislaby.
T. subfuscus Fall. Among grass, Mulgrave Woods.
Limotettix sulphurella Zett. Aislaby.
 **L. persimilis* Edw. Common among grass, Mulgrave Woods and Runswick.

- * *Cicadula variata* Fall. In considerable numbers on *Teucrium scorodonia* growing on the refuse heaps from the old alum workings at the foot of the cliffs at Sandsend.
- * *Alebra albostrigella* Fall. The type form along with the vars. *wahlbergi* Boh. and *fulveola* H. S. in the Mulgrave Woods.
- * *Dikraneura variata* Hdy. Common at Sandsend, among grass.
- * *Empoasca smaragdula* Fall. A widely distributed and common species, occurring on birch and willow, Grosmont, Sleights and Mulgrave Woods.
- * *Eupteryx vittatus* L. Sandsend.
- * *E. urticae* Fab. Sandsend.
- * *E. stachydearum* Hdy. Sandsend, Robin Hood's Bay.
- * *E. signatipennis* Boh. Plentiful on *Spiraea ulmaria* at Sandsend, Runswick, and Robin Hood's Bay.
- * *E. pulchellus* Fall. Common on oaks, Mulgrave Woods.
- * *E. concinna* Germ. With the last, Mulgrave Woods.
- * *Typhlocyba douglasi* Edw. Common on roadside limes, Sleights.
- * *T. crataegi* Dougl. On hawthorn, Aislaby, Sandsend and elsewhere.
- * *T. quercus* Fab. Plentiful on blackthorn, Sandsend.
- † *T. nitidula* Fab. Plentiful on elms, Mulgrave Woods.
- * *T. geometrica* Schr. On alders, Sleights, Grosmont.
- * *Zygina alneti* Dahl. Sandsend.
- * *Z. coryli* Toll. Sandsend.
- * *Z. flammigera* Geoff. Mulgrave Woods.
- * *Z. neglecta* Edw. Grosmont, Goathland.
- † *Z. scutellaris* H. S. Plentiful among grass, Sandsend, Runswick.
- * *Cixius nervosus* L. Mulgrave Woods, Sandsend, Aislaby, Runswick.
- * *Conomelus limbatus* Fab. Plentiful at the roots of rushes, Sandsend, Runswick.
- * *Delphax fairmairei* Perris. Sandsend, Goathland.
- * *Dicranotropis hamata* Boh. Very plentiful, Sandsend.
- * *Rhinocola ericae* Curt. Sandsend, among the heath growing on the refuse heaps at the foot of the cliffs.
- * *Psylla alni* L. Common and widely distributed, Grosmont, etc.
- * *P. nigrita* Zett. On firs, Mulgrave Woods.
- * *P. spartii* Guer. Plentiful on broom, Aislaby.
- * *P. peregrina* Forst. Common on hawthorn, Sandsend and Grosmont.
- * *Arytaena genistae* Latr. Plentiful on broom, Aislaby, Grosmont.

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The *Entomologist's Record* for February contains an article on Grimaldi, the Clown, an Entomologist.

The *Essex Naturalist*, October, 1924—March, 1925, contains a figure and description of *Trouessartella falcata*, a rare water mite from Epping Forest, by C. D. Soar; 'Prehistoric Implements from the Thames Valley,' by S. H. Warren; an obituary notice of the late W. Whitaker; short notes, etc.

In a report of a meeting of the Royal Irish Academy appearing in *Nature*, we learn that 'When isomethyldiphenylcyclopentenone is warmed with dilute alcoholic hydrochloric acid, it changes into methyldiphenylcyclopentenone. This compound condensed with benzaldehyde to yield benzylidene-methyldiphenylcyclopentenone, which is identical with the tri-condensation product of benzaldehyde and methylethylketone obtained by Ryan and Devine. Anisaldehyde condensed with methyldiphenylcyclopentenone to yield anisylidene-methyldiphenylcyclopentenone, and the isomeric compound obtained by Ryan and Devine by the action of anisaldehyde on a-benzylidene-methylethylketone is anisylidene-methylphenylanisylcyclopentenone.' There is, apparently, a difference between 'science' and 'natural science.'

ON THE PLIOCENE CRAG OF TJÖRNES, NORTH ICELAND.

HANS SCHLESCH, M.A.S.

TJÖRNES is a small peninsula between the Gulfs Skjálfandi and Axarfjörður, in N. Iceland; and along the west coast of this, at a distance of about four English miles, between the brook of Kaldakvisl, near the small town Húsavík in the south, to Höskuldsvík in the north, there are extensive Crag deposits (about 150 metres). The beds have a considerable inclination to the north-west, and are intersected by numerous dislocations. During the glacial periods a considerable part was certainly carried away, but, thanks to the overlying Dolerite, much is left of this valuable fossil deposit. It has a well-marked stratification, and nearly all the fossil forms belong to the *Laminaria* zone. While the horizons of the British Crag were formed during relatively short periods, it seems we have in the Tjörnes Crag an uninterrupted formation during a longer period, deposited inside the sinking plateau—all other Pliocene deposits in Iceland being found in the sub-marine plateau around the island—in the volcanic period of rest between the regional and insular Basaltic formation of Iceland. The beds show relationships with the English-Belgian Crag* and probably later it will be possible to make comparisons, though naturally the Tjörnes Crag has a more northern character, including *Pecten islandicus* Müller, *Admete sheppardi* A. Bell, *Lora woodiana* Möller, *Bulbus smithii* Brown, *Euspira tenuistriata* Dautzenberg and Fischer, *Papillaria cinerea* Couthouy, and *Nacella pellucida* Linné—all quaternary representatives in English deposits—while the recent circumboreal, *Turritella erosa* Couthouy, has not yet been observed in the Tjörnes Crag, and first occurs in the quaternary of Iceland (Búlandshöfði, Snaefellsnes), analogous to the quaternary of the British Isles. The very mixed faunistic character indicates that the climate has undergone changes. The thirty-three recently extinct forms and the few Lusitanian ones are probably a survival from an earlier period. Two forms occur to-day only in the Behring Sea; about 35 are North Atlantic, of which 11 are living on the coasts of North America, 65 have a circumboreal distribution and only about 50 per cent. are recently found on the coasts of Iceland; several, moreover, only in the more temperate area along the south-west coast; while the faunistic character of the marine gastropods in the Golf Skjálfandi at Tjörnes now-a-days is more arctic.

* Cf. *Quarterly Journ. Geol. Soc.* London, 1885, p. 966, *Geol. Mag.*, viii., London, 1871, p. 391.

Besides the results of my own visit in July 1921, I have received large lots from different parts of the formation by the kindness of an intelligent farmer, Mr. Kári Sigurjónsson, of Hallbjarnarstadur. Mr. Alfred Bell has kindly examined the majority of this. Further, I am also greatly indebted to a former keen worker of the British Pliocene Mollusca, the late Fredric William Harmer; Dr. Nils Odhner, of the Swedish State Museum in Stockholm, Dr. W. Wenz, Frankfurt-on-Main, and several others. The results appeared in *Archiv für Molluskenkunde*.* As the geological-mineralogical Museum in Copenhagen already has the Mörch collection from Tjörnes, I have presented my general collection to this Museum, but most of the forms are also to be found in the Harmer collection (in the possession of the British Museum) as well as in the Schlesch collection, Hull Museum.

A complete and extensive list of the various species from this Crag occurs in my paper, a copy of which can be referred to in the Hull Museum library.

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In *The Transactions of the Entomological Society of London*, issued on February 20th, which contain nearly 700 pages and 50 plates, there is one paper dealing with British Entomology, namely, 'British Fungus-Gnats (Diptera, Mycetophilidæ), with a revised Generic Classification of the Family,' by F. W. Edwards.

G. F. Bates contributes an obituary notice of W. Barclay (1846-1923); R. R. B. Watson describes in detail 'The Deuchny Hill Fort'; J. Menzies, 'Additions to the Discomycetes of Perthshire'; and G. F. Bates gives 'A Preliminary List of Perthshire Diatoms,' to *The Transactions of the Perthshire Society of Natural Science*, recently issued.

In a discussion on H. C. Boydell's 'Rôle of Colloidal Solutions in the formation of Mineral Deposits' (*Bulletin Institution of Mining and Metallurgy*, No. 243), it is stated that 'At the Hatfield Main Colliery, Yorkshire, it was found practically impossible to force the cement into fissures in the Red Sandstone formations, as the cement would not travel any distance from the end of the bore-holes into the fissures of the rock. The difficulty was overcome by the separate preliminary injection of solution of sodium silicate and sulphate of alumina into the fissures, after which the cement could be successfully injected and the fissures closed.'

Bulletin No. 3, Part III., August 1st, 1923, pp. 75-152, Plates VII. and VIII. (London: Wheldon and Wesley), issued by *The New Zealand Institute*, contains a further instalment (Parts I. and II. were issued in 1913 and 1914) of Mr. H. N. Dixon's studies of the Bryology of New Zealand, with special reference to the Herbarium of Robert Brown of Christchurch, New Zealand. The orders dealt with are *Dicranaceae*, *Leucobryaceae*, *Fissidentaceae*, *Calymperaceae* and *Pottiaceae*. There is a masterly criticism of a number of obscure species and their complicated synonymy which should be consulted by those who are interested in the island flora.—W. H. B.

* *Zur Kenntnis der pliocänen Cragformation von Hallbjarnarstadur, Tjörnes, Nordisland, und ihrer Molluskenfauna*, mit 12 Tafeln, Frankfurt a/Main, 1924, Bd. 1, Heft. 3, p. 309-70. Price 3½ goldmk.

FIELD NOTES.

BIRDS.

Storm Petrel in Sheffield.—On the 22nd September, 1924, a Storm Petrel was found in an exhausted state in the yard of one of the large steel works at Brightside, Sheffield. The weather had been exceptionally stormy during the preceding week-end. It was sent to the Weston Park Museum, where I saw and handled it on the 26th, still alive, thanks to the careful nursing it had received. It was a fully matured bird, and did not appear to have received any injury in its travels, but it died about a week after its capture.—ARTHUR WHITAKER, Dore, near Sheffield.

Green Plover from Öland caught near Louth.—A metal ring bearing 'MUSEUM GÖTEBORG SWEDEN, 2302C,' taken from the leg of a Lapwing caught at Covenham, near Louth, was brought to me with the report that the bird was caught about a week previously. I posted particulars to the Swedish Museum, and have now received a letter from Professor L. A. Jägerskiöld, in which he says 'the Peewit, or Greenplover (*Vanellus cristatus*), in question was ringed as a young bird in June, 1924, on Öland (a big island in the Baltic).'

—C. S. CARTER, Louth, Lincs., January 26th.

Iceland Gulls at Scarborough.—On November 14th, 1924, I saw in the harbour an immature Iceland Gull, in the cream-coloured second year's plumage. The bird was again seen on the following day, and subsequently on November 19th, after which it disappeared. On January 3rd, 1925, another Iceland Gull visited us, this time a bird of the year in the fawn-coloured plumage. It was subsequently seen on several dates up to March 3rd. Both birds were exceedingly tame and could be watched at the distance of a few feet from the pier, as in company with Black-headed, Common and Herring Gulls, they picked up scraps from the drain outlet just below.—W. J. CLARKE.

Little Owl at Bridlington.—On the 5th February, Mr. Robert Veitch, gamekeeper for Y. G. Lloyd Greame, Esq., of Sewerby House, caught a Little Owl in a steel trap which had been set for a rabbit on the Sewerby estate. This bird is one of two that have been seen at Sewerby. Mr. Veitch has neither heard of, nor seen, the Little Owl previously in this district. The keeper on a neighbouring estate tells me he knows the Little Owl very well, but he has not seen one since he came here four years ago. The trap had been set in a rabbit hole in a chalk cutting by the side of the railway near Flamborough station. As it had been pushed well into the hole the Little Owl was either entering or leaving

the burrow. It seems probable this bird saw a mouse going into the hole and followed it, and in this way sprang the trap, which caught it by one leg. It was alive when found. The only time I have seen the Little Owl in the Bridlington district was in December, 1920, when one frequented the buildings on 'Flat Top Farm,' where it remained three days, roosting in a hole in the wall just underneath the eaves.—R. J. FLINTOFF.

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MAMMALS.

Grey Squirrel near Ripon.—A friend recently informed me that he shot a Grey Squirrel in Ripon Parks in November, 1923. It was running through some long grass, and was mistaken for a rat, hence the shooting. A second one has been caught in a trap at Plompton.—R. FORTUNE.

Irish Elk Remains in Cumberland.—The photograph

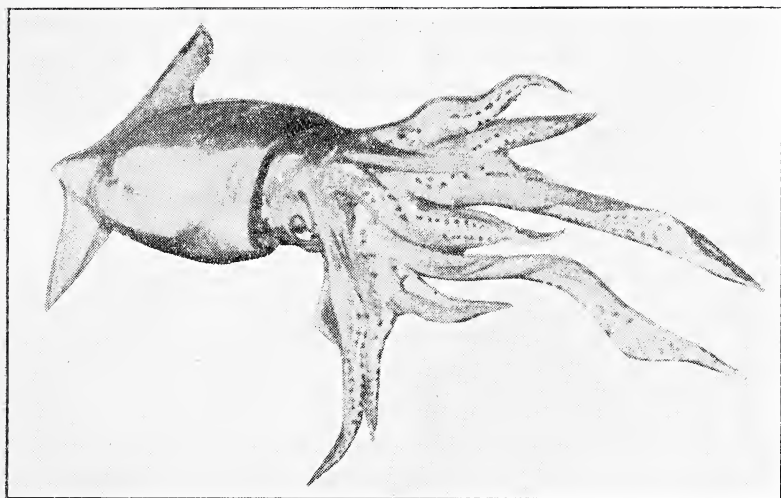


reproduced herewith hardly gives a correct impression of the magnitude of the skull and pair of antlers of the Irish Elk (*Cervus megaceros*) which have recently been added to the Geological gallery in the Municipal Museum at Hull. They have been kindly presented to the Museum by Lieut. J. G. Roper, of Cumberland, who states that, while he has no precise details, the antlers are generally considered to have been excavated at Westwater about sixty years ago. The dimensions are : straight across from tip to tip, 7 ft. 8 ins. ; measuring round the curve, 10 ft. The skull, which has been sawn off at the front, measures 17½ ins. We are indebted to Dr. F. A. Bather, F.R.S., of the British Museum (Natural History), for recommending to the owner that it be given to us.—T. SHEPPARD.

Ocellated Sand Skink (*Chalcides ocellatus*) at Scarborough.—An example of this interesting little lizard was found alive in a box of Jaffa oranges on December 22nd, 1924. It measured about 9 inches in length, and was quite lively when turned out. In its native haunts it inhabits dry sandy districts in Northern Africa, South Eastern Asia, and a few localities in Southern Europe, burrowing beneath the surface, and seldom coming to the top. In captivity it followed the same habit, hiding beneath the dry soil in the bottom of the case in which it was kept, and on no occasion coming voluntarily to the surface. It is now in the Zoological Gardens, London.—W. J. CLARKE.

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Large Squid on the Yorkshire Coast.—On January 3rd a large Squid was stranded on the beach at Withernsea in a



dying condition, and after being exhibited at Withernsea and Hull it was forwarded to the Natural History Department of the British Museum, which had expressed a wish to possess it. The squid measures 7 ft. 1 in. from the apex of the mantle to the tip of the tentacles. Recently Mr. G. C. Robson, of the British Museum, exhibited and described it to the members of the Zoological Society of London, and his paper will appear in the usual course in the Society's *Proceedings*. Mr. Robson informs us that the name of the specimen is *Stenoteuthis caroli* Furtado, and that it is an Oigopsid Cephalopod referable to the family Ommatostrephidae, and is a very rare species. The common *S. pteropus* and *S. bartrami* are

frequently met with on the west coast of Europe. The illustration herewith is from a photograph taken from the front of the animal, when first caught; consequently the tentacles are exaggerated in size compared with the body.—T. SHEPPARD.

Unusually large Fatherlasher at Scarborough.—An example of *Cottus bubalis*, captured by an angler off the pier at Scarborough, weighed $1\frac{1}{2}$ lbs., and is much the largest example of this species I have seen. The largest I have seen previously weighed 1 lb. $\frac{1}{2}$ oz., and measured exactly 12 inches in length.—W. J. CLARKE.

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ENTOMOLOGY.

Saturnia carpini in the Huddersfield District.—Referring to *The Naturalist*, 1925, p. 60: at the end of July, 1924, I saw fourteen almost fully-grown larvæ on part of the moorland remnants near Upper Oldfield, Honley. On September 10th, 1924, I had given to me a fully-grown larva (which is now in the pupal stage) obtained on the moorland near Cook's Study, Holmfirth. It was one of five which were observed at the time.—W. E. L. WATTAM, Newsome.

Fortunately *S. carpini* is still common on probably all the moors sufficiently far from Huddersfield to be little affected by town influences of various kinds. My note, referred to by Mr. Wattam, applied to the moors in the almost immediate vicinity of the town.—G.T.P.

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We saw from the press, in an announcement of a proposed visit of the Leeds City Council to the Temple Newsam Museum, that it contains 'one of the finest collections of armour in the world,' but in the report of the visit not a word was said about this wonderful collection, which seems a pity, as many would like to hear about it. Leeds is certainly doing well. We heard a little while ago that it had one of the finest collections of birds in the country (an honour which has recently been claimed for a place not very far from Wigan); it was once going to have one of the finest collections of casts of prehistoric skulls in the country. The *Yorkshire Post* of the 10th February tells us that the Public Library there has the best book collection in Yorkshire (and certainly its collection of Yorkshire books is a very fine one), and so on.

It must feel nice for authors of papers in a certain scientific periodical to find the editor giving his views on their papers. In the March issue one writer gives the 'Story of Marvellous Discoveries' in the language of bees! In another we learn that from early instruments 'our modern instruments of precision have been developed.' In another we learn that 'Profound scholarship is not necessarily accompanied by any expert knowledge'; later we find that 'the male [flea] is relatively rare, and seldom found by the pond hunter.' Another is 'an authoritative article.' The next is also an 'authoritative article.' The next 'might enable us to solve the food problem by changing wood into sugar,' and so on. In any case the editor is original for once in that he does not pray for new subscribers.

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(To be continued).

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Chats on British Mammals, by Jas. J. Simpson, M.A., D.Sc., 122 pages, 20 illustrations, price 2/6. The Sheldon Press, 1924. It is almost impossible to say anything really new with reference to our native mammals. Dr. Simpson has, however, managed to give, in an interesting and pleasant manner, much information about sixteen species, which, if not new, will at least be useful to the young naturalist, to whom, and to the uninitiated, the book primarily appeals. The various articles are the result of ten-minute wireless broadcasting talks, which were afterwards elaborated and originally published in *The South Wales News*.—R. F.

NEWS FROM THE MAGAZINES.

Mr. G. W. Lamplugh writes on 'Robert Browning as an Exponent of Research' in *Nature*, No. 2887.

'Glimpses of Village Life: I., The Excommunication of Caterpillars and kindred matters,' by G. G. Coulton, appears in *The History Teachers' Miscellany* for January.

'Gout Fly of Barley,' by A. D. Imms, and 'Downy Mildew of Hops,' by E. S. Salmon and W. M. Ware, are among the many contributions to *The Journal of the Ministry of Agriculture* for March.

A particularly valuable paper appears in *The Entomologist's Monthly Magazine* for February, entitled 'Observations on British Coccidæ,' by E. Green, in which he describes and illustrates some new species.

C. N. Hawkins figures and describes *Campptogramma bilineata* L., ab. n. *virgata*, from Kent, in *The Entomologist* for March. In the same journal Elsie MacGill describes a Proboscis of *Calliphora* with two pairs of palps.

In *The Annals and Magazine of Natural History* for February, the Rev. J. E. Hull describes some new and rare British species of the Acari of the Family Gamasidæ. These are from Northumberland, Durham, and other northern localities.

In *The Annals and Magazine of Natural History* for March, M. R. Sahni has a valuable paper on 'Morphology and Zonal Distribution of some Chalk Terebratulids,' his material being largely drawn from Norfolk, Sussex and Surrey. We notice there is a new genus, *Chatwinothyrsus* presumably called after a member of the staff of the Geological Survey, though we are not quite sure of the meaning of the word!

In *The Entomologist's Record* for February, Mr. Kettlewell, of Godalming, states that in a sheltered corner of a garden near the sea at Bridlington, where no trees were planted, there was a mass of *Convolvulus major*, largely eaten by the larvæ of the 'Buff Ermine,' but from the mass he obtained many larvæ of the Puss Moth, from which he bred several specimens. 'When the time of pupation arrived, they found their way up the side of a brick wall and made their cocoons in the depth of the ivy that grew there, so that the only way to discover their whereabouts was to pull back the ivy, which exposed the shining undersides of the cocoons. Surely this is a very unusual foodplant?'

The Journal of the Marine Biological Association for March (pp. 531-754, 6s.) contains a remarkable collection of valuable memoirs, those most likely to appeal to our readers being: 'The Growth of Some Lamellibranchs in Relation to the Food-supply of Fishes,' by E. Ford; 'Food of the Bottom Fauna of the Plymouth Fishing Grounds,' by O. D. Hunt; 'Some Marine Ciliates at Plymouth, with a description of a new species,' by W. De Morgan; 'Young Anglers and their Enemies,' by M. V. Lebour; 'Euphausiids,' by C. F. Hickling; '*Obisium maritimum* Leach near Plymouth,' by H. F. Barnes; and 'Seasonal Changes in the Water and Heleoplankton of Fresh-water Ponds,' by W. G. Atkins and G. T. Harris.

The South-Eastern Naturalist for 1924, recently issued, is the final editorial effort of Mr. E. A. Martin, F.G.S. (referred to in the text, presumably as a joke, as 'Commander' Martin). It contains a lengthy account of the Guildford Congress, details of the work of the various Sections, reports of delegates, etc. There is the Presidential Address of Sir Richard Gregory on 'Science in Civilisation.' The journal is issued free to members of the South-Eastern Union of Scientific Societies, and is sold to the public at five shillings, which is not at all an unreasonable price (lxxxvii.+99 pp.) The frontispiece consists of a photograph of the members at the Haslemere Museum, from which it would seem that in the south of England people have to reach a ripe age before becoming 'scientific,' there being very few young people in the group.

THE STUDY OF CHIRONOMIDS.

ON the evening of Monday, Feb. 23rd, Mr. G. Grace, B.Sc., of Ilkley, read a paper on 'The Study of Chironomids' before the Bradford Natural History Society and the Entomological members of the Yorkshire Naturalists' Union, the lecture being made available to the latter by the kind invitation of the Bradford Society. Mr. Grace's exposition was clear in every detail; especially in the anatomical portion, which was explained in a lucid fashion, helped by the excellent lantern slides the lecturer had prepared from his original diagrams and preparations.

Mr. Grace introduced his subject by describing the methods he follows in the collection, preservation and tabulating of the flies. Owing to the present insufficient descriptions of most of the species, Mr. Grace describes every species he collects; thus, when completed, his work will put the Yorkshire Chironomids on a sound footing.

The lecturer next dealt with the anatomy of the flies to some length.

These details were followed by a short sketch of the sub-families and main genera.

Mr. Grace made an earnest appeal to all Yorkshire Naturalists, even if they cannot afford time to work the Chironomids systematically, at least to collect specimens, which either Mr. Grace or Mr. W. D. Hincks, of Leeds, will endeavour to work up with the object of making our knowledge of the Yorkshire species as complete as possible.—W. D. HINCKS, *Hon. Co. Sec.*

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A stone hammer, found some years ago between Grimsby and Cleethorpes during the opening of a new clay pit, has been deposited in the Lincoln Museum. The implement is attributed to the Bronze Age! *Local Paper*. To this *Punch* adds 'And was described, no doubt, by the tradesman of the period as 'a genuine antique.' What *would Punch* have said about the Bronze-age stone hammer recently discussed by experts in prehistoric matters in the Sheffield papers?

We see from the report of the Annual Meeting of the Yorkshire Philosophical Society, recently presented, that a special Committee considers the Hospitium unsuitable for the exhibition of the Roman relics it contains, and an extension to the Museum is suggested on the south-east side of the building, which would cost approximately £16,000. It would certainly be an advantage to have these relics more adequately exhibited, but this new suggestion seems to dispose of the scheme for rebuilding the Museum which was referred to in these pages in Dec., 1923!

We learn from *The Yorkshire Post* recently, referring to the old aisled tithe barn at Easington, 'a correspondent says that the original suggestion that it should be removed to Hull, and preserved in one of the parks, was made and building. Thee (*sic*) then Lord Mayor and agreed to by the Ecclesiastical Commissioners purely in the interests of the preservation of the members of the Hull Corporation.' The report goes on to say that 'the arrangements for this are in the hands of Mr. T. Sheppard, M.Sc., of the Hull Museums.' Personally, we doubt very much whether Mr. Sheppard considers it practical or desirable to 'preserve the members of the Hull Corporation.'

In October, 1922, a circular was sent round asking for subscriptions to a new work on British Butterflies, by Mr. S. L. Mosley, and, possibly with others, the present writer subscribed to this. Later a second part was issued, and there the matter seems to have ended. As the subscription was rather a heavy one and the two parts already issued, by themselves, are almost worthless, it is a pity that such an enthusiastic worker as Mr. Mosley does not consider the prospect of completing a publication of this nature, before starting it. This is by no means the first of its kind emanating from Huddersfield, but so far as we are concerned it will be the last to which we shall subscribe. Our library is almost paved with incomplete publications, though all started with good intentions.

NORTHERN NEWS.

Dr. Walcot Gibson, F.G.S., has been elected a Fellow of the Royal Society of London.

We should like to congratulate the Rev. T. R. Stebbing, F.R.S., the distinguished zoologist, on attaining his 90th birthday.

Answers to numerous correspondents:—We don't know a word with that number of letters which means what you suggest.

The Yorkshire Archaeological Society has purchased No. 10 Park Place, Leeds, for £3,500, for its library and as a meeting place and lecture hall.

The death is announced of Sir Edward Thorpe, the well-known chemist. He was one of the first four Professors of the Yorkshire College, now the Leeds University, and was President of the British Association at Edinburgh in 1921.

The Belfast Museum Publication, No. 84, deals with 'Ulster Antiquities: The Stone Age,' and is a well-illustrated description of the various objects found in the North of Ireland, varying from small flint arrow points to stone circles.

Dr. Norman H. Joy has presented some British Coleoptera to the Natural History Museum, South Kensington, including several new species. An anonymous donor has also sent forty species hitherto unrepresented in the collections.

The London County Council has issued a second edition of its *Handbook to the Horniman Museum*, dealing with The Evolution of the Domestic Arts (44 pp., 3d.), and a third edition, re-written, of its *Handbook to the Freshwater Aquaria and Vivaria* (54 pp., 3d.).

'Oh! Appleby-on-the-Eden must surely be the place where first young Adam opened his eyes and looked upon Eve's sweet face; and Appleby-on-the-Eden must surely be part of the land where Adam and Eve in a new made world went wandering hand-in-hand.'—*Punch*.

We should like to congratulate the British Museum authorities and the hard working editor, Mr. C. Davies Sherborn, on the appearance of still another part (VI.) of 'Index Animalium.' This contains the words 'Ceyl' to 'Concolor,' pages 1197-1452, covering the period 1801-1850.

According to *The Morning Post* recently, some mammoth bones have been found in London 'In blue lias, a stratum of the middle Pleistocene period. They were deposited contemporaneously with Neolithic Man.' Evidently some of our 'Prehistorians' are migrating to the London area.

We notice that, following on Professor Dart's account of his discovery of an ancient skull, which appeared in *Nature*, Sir Arthur Keith, Sir Arthur Smith Woodward, Mr. E. N. Fallaize, and *Punch*, have each contributed to our knowledge of the so-called 'missing link' recently found at Taungs in Africa.

'Whereas we dislike burglary, we lend it a halo of romance in particularly daring cases by attributing to the criminal some of the graceful agility and scorn of convention which we notice in the common cat.'—*Punch*. The Museums curator at Hull, who, incidentally, tries to be a naturalist, never thought of that!

According to the press for March 14th, a Thrush's nest, with two eggs, was found the previous week in a garden at Skidby, near Hull; an Ivory Gull has been captured by a local fisherman at Whitby, and a female Great-crested Grebe has been killed at Keswick. There is a law to prevent this sort of thing, but apparently its influence is not felt in some of the wilds of this country.

Dr. W. E. Collinge, of the Museum of the Yorkshire Philosophical Society at York, is issuing in parts 'The Food of Some British Wild Birds: a Study in Economic Ornithology.' A subscriber to this tells us that he has received the first instalment, numbered 'Parts 1 and 2,' (64 pp.), price 12/6. The publication will doubtless be useful, but an expensive item before it is completed.

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THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL
PRINCIPALLY FOR THE NORTH OF ENGLAND.

EDITED BY
T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums Hull;
and T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Technical College, Huddersfield,
WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
G. T. PORRITT, F.L.S., F.E.S.
JOHN W. TAYLOR, M.Sc. RILEY FORTUNE, F.Z.S.

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EXCURSION TO MIDDLETON-IN-TEESDALE, WHITSUNTIDE, MAY 30th TO JUNE 1st.

In this Excursion the Union will be joined by the Yorkshire Geological Society, and by the Wallis Club (Durham).

In view of the exceptional circumstances with regard to limited accommodation in a popular holiday resort, intending visitors should book their rooms as early as possible. Headquarters have been arranged as follows :—Yorkshire Naturalists' Union and Yorkshire Geological Society—Miss Hallett, Heather Brae, Middleton-in-Teesdale ; Wallis Club—Cleveland Arms Hotel, Middleton-in-Teesdale. Terms, 11/6 per day ; visitors staying at Headquarters must be willing to share rooms. A detailed Circular will be issued well in advance of the date fixed for this Excursion.

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Apply—Editor, The Museum, Hull.

NOTES AND COMMENTS.

UNIVERSITY OF LEEDS.

The President of the Yorkshire Naturalists' Union has received the following communication from the University of Leeds* :—

' We would take the earliest opportunity after the conclusion of the celebrations of the Jubilee of the Yorkshire College and the Coming of Age of the University of Leeds, to convey to you our high appreciation of the honour and the favour which you have shewn to the University by participating in our rejoicings on this auspicious occasion. The University will ever be mindful of this gratifying evidence of your interest in our welfare. In particular we shall preserve amongst our most treasured possessions the address in which you embodied your felicitations on our anniversary, your goodwill towards us, and your generous hopes for our future prosperity. We welcome the widespread recognition of the services rendered by our University to the cause of liberal knowledge ; and we gladly face the years to come assured of our continuing fellowship with the Institutions and Societies for Higher Learning throughout the British Empire.

(Sgd.) DEVONSHIRE, *Chancellor.*

E. G. ARNOLD, *Pro-Chancellor.*

J. B. BAILLIE, *Vice-Chancellor.*

A. E. WHEELER, *Registrar.'*

THE PURPOSE OF EDUCATION.†

A new and cheap edition of ' The Purpose of Education : An Examination of Educational Problems in the Light of Recent Scientific Research,' has been issued by the Cambridge University Press. The author points out that ' Of recent years we have witnessed, in various directions, a strong revolt against what is vaguely called the " Mechanistic theory " of life, and against the " Pernicious trend of materialistic science." This revolt is leading to an unholy revival of superstition and quackery on the one hand, and on the other, the serious efforts to interpret the unexplained phenomena of life and mind by the evolution of the science of psycho-physical biology. This science, although by no means new, has not yet received the attention it deserves. It does not require that all the laborious researches of eminent experimentalists in the fields of physics, physiology, chemistry, biology, psychology and anthropology should be discarded as useless, but it does require that the outcome of all these researches

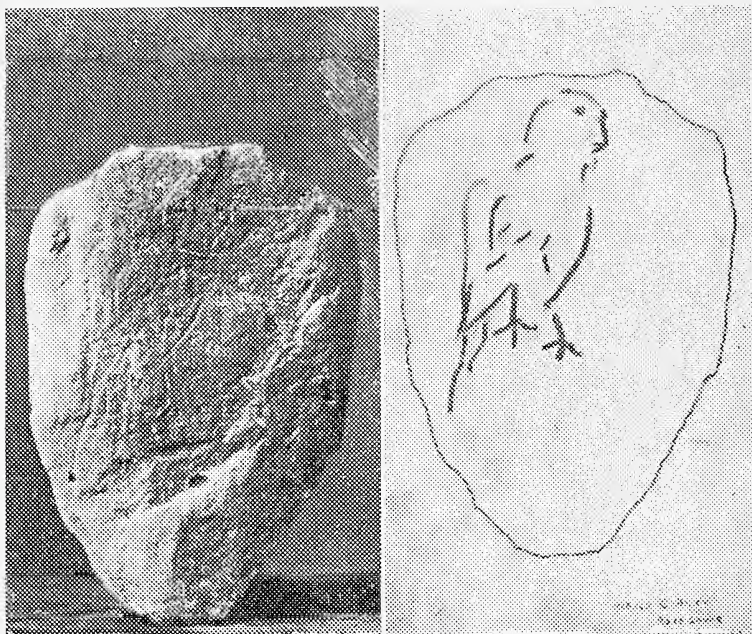
* See page 39.

† By St. George Lane Fox Pitt, revised and enlarged, xvii.+92 pp., 4/- net.

should be correlated and synthesised. This small volume is intended to introduce inquirers to the elements of this science ; and it is hoped that the psycho-physical treatment of educational problems may offer at least a clue to their satisfactory solution.'

AN EARLY BIRD.

We gather from *The Burnley News* that a paper was recently read at a meeting of the Prehistoric Society of East Anglia, at the request of the British Museum authorities, on the



' Old Stone Age passed into the Iron Age in East Lancashire,' by Mr. John Whitham. Among the specimens described from Watson Laithe ' was a tablet made of a fragment struck from a water-worn boulder, and on which there was found to be engraved the outline of a bird—one of the rare examples of Stone-Age art. This was found buried along with a few stone weapons, at the place indicated, on January 24th, 1909.' We have been permitted by the Editor of *The Burnley News* to reproduce the illustrations of this ' rare example of Stone-Age art,' but regret we cannot accept it as evidence of Palæolithic Man in these parts. It would be interesting to know what was the opinion of the British Museum or the Prehistorians on the matter.

YORKSHIRE JURASSIC PLANTS.

At a recent meeting of the Royal Society, Mr. H. H. Thomas read a paper on The Caytoniales, a new group of angiospermous plants from the Jurassic rocks of Yorkshire. The fossils are the remains of megasporophylls with carpels, fruits and seeds of two distinct types, and male inflorescences bearing stamens. They were found in the Gristhorpe Plant Bed in the Middle Estuarine Series, exposed on the Yorkshire coast in Cayton and Gristhorpe Bays. The species *Gristhorpia Nathorsti* gen. et sp. nov. had pinnate megasporophylls 4-5 cm. long, with an axis about 1 mm. wide; the sub-opposite pinnæ terminate in small more or less spherical carpels 2-5 mm. in diameter. The carpels have a stigma at the base near the pedicel. Winged pollen-grains were found on some of the stigmas. The seeds had a well-developed megaspore membrane with an apical projection, above which was a micropyle lined with cutinised cells. *Caytonia Sewardi* possessed megasporophylls agreeing generally with those of Gristhorpia, but the stigma was a small basal flange. The carpels and fruits contained two rows of ovules or seeds, with hard woody or stony testas. The remains of the male inflorescences are of a type previously known as *Antholithus* sp. and now named *Antholithus Arberi*. They were probably borne on the same plants as *Gristhorpia Nathorsti*. The anthers were four-lobed sessile structures, of a form very like that found in many modern Angiosperms, and had a longitudinal dehiscence. There are no traces of perianth members or bracts. There is a constant association of megasporophylls and fruits, with leaves of *Sagenopteris Phillipsi* Brongn. The comparative examination of the cuticular structure of the axes of Gristhorpia and Caytonia, and of the petioles of Sagenopteris fronds, makes it probable that Sagenopteris must be regarded as the leaf of the Caytoniales.

GEOLOGICAL SURVEY OF YORKSHIRE.

The Geological Survey has now opened a branch office at 14a Parliament Street, York. Work on the revision of the maps of the coalfield began in 1923, the Huddersfield Sheet (77) of the small series one-inch map being taken in hand first, in order to be in continuity with the work of the Lancashire unit; the memoir on the Concealed Coalfield has also been revised, and the new edition may be expected shortly. All Survey work for Yorkshire and for the Derby and Notts. part of the coalfield will be dealt with through the York Office, where the staff consists of Messrs. G. V. Wilson, D. A. Wray, J. V. Stephens and Wilfrid N. Edwards, under Mr. C. E. N. Bromehead as District Geologist. It may be noted that the three senior members are all Yorkshiremen. The staff is

anxious to form a collection of papers on the geology of the district for the use of themselves and any future members : if authors are able to send reprints to the District Geologist for this purpose they will be gratefully acknowledged.

WATER COLOUR EXHIBITION.

The writer has recently had the pleasure of inspecting the excellent 116th Exhibition of the Royal Institute of Painters in Water Colours, which makes particular appeal to anyone interested in nature. A naturalist also sometimes sees more



Charing Cross, B.C.

in a picture than the artist intends. As indicating an artist's idea as to the relative proportions of a mammoth and a reindeer, Mr. Charles Whymper, R.I., has a picture, 'Charing Cross, B.C.,' an illustration of which we are kindly permitted to reproduce.

THE WHALING INDUSTRY.

That the whaling industry is far from being extinct, as is popularly supposed, and that in certain waters is greater than ever, was the information given by Sir Sidney Harmer in a lecture recently. He said that at the beginning of the present century whaling appeared to be drawing to a close, but the position was altered by the discovery of a new whaling field in sub-Antarctic waters, where the industry is being conducted

on a scale never before equalled. Although this branch of the trade only commenced in 1904, the humpback whale, belonging to the rorqual group, has shown an alarming decline in numbers; and this was noticeable eight years after the beginning of sub-Antarctic whaling. At present the industry there depends almost entirely on the fin whale and the blue whale, the latter the largest animal known, and reaching a length of one hundred feet. A certain number of sperm whales were also being caught off the South African coast. Unlimited whaling had resulted in the reduction of the number of whales to vanishing point in some places, and there was the ominous fact that the whales had not returned to areas where they were formerly abundant, on the cessation of whaling. He instanced the case of the Greenland whale, the pursuit of which had not been carried out on more than a small scale since the middle of the last century, and yet Greenland whaling was now extinct, in spite of the freedom from persecution that this species had enjoyed for so many years, no more than a few stragglers being now found in the Arctic seas. All of them seemed to have deserted Spitzbergen, where they were first found in enormous numbers.

LOCAL NATURAL HISTORY.

In an article on 'Local Natural History in Great Britain,' appearing in *Nature*, No. 2886, we learn that:—'The smaller and less wealthy local societies have received much encouragement and stimulation by their affiliation to form larger bodies, of which the Yorkshire Naturalists' Union is so splendid an example. This and other similar bodies, like the recently formed Union of South-Western Societies, the South-Eastern Union of Scientific Societies, the Lancashire and Cheshire Fauna Committee, and the Faunal Survey of Glamorgan, are attempting to systematise research among affiliated societies and to carry it out on the broad lines suggested above. We should like to see this principle of larger unions extended to embrace the whole country, so that with the local societies affiliated to their proper union, and the unions in turn affiliated to one or other of the scientific societies in London, or, as now, to the British Association, a complete organisation would be brought into being for the thorough co-ordination of the work of local societies. The unions perform another and perhaps equally important function in bringing the results of scientific research before the general public of the areas they represent, by holding annual congresses at which leading men of science deliver addresses on the special subjects of their own work. It is impossible to estimate the value or to over-emphasise the importance of the work which the larger unions are doing by this means.

A direct link is established between the local societies and scientific workers of the first rank, and the stimulus which the former receive as the result of this contact must largely influence their members and encourage them in the work they are seeking to do.' In addition to the Unions mentioned, there is the Lincolnshire Naturalists' Union, the Northern Naturalists' Union for Durham and Northumberland, and we believe a similar Union has recently been formed, or is being considered, for Scottish scientific societies.

WONDERFUL LEAVES.

' Leaves, leaves, wonderful leaves,
Have you no story to tell,
Leaves that are fragile yet active and agile,
Because of the work in the cell.
How is your workshop, so frail and so tender,
Set up and exactly controlled?
How do you know when the frost and the snow
Betoken that you may be bold ? '

We referred to some poems of Mr. Westell's in this Journal some time ago, and the remarks then made still seem to apply. The present volume* is full of ' wonderful leaves,' in which a sample is given in the above lines. Possibly the book will appeal more to some readers than it does to the present writer. The songs are given in the order in which they were written, so that presumably the last one, after over 200 pages of them, should be perfection. We give it ' and regret we cannot more assist his soul to pour forth anew ' :—

' What a difference it makes
When folks are kind
As the soul pours forth anew,
And constancy shines
In this heart of mine
For the good that the world can do.'

HUMBER CHANGES.

At a recent meeting of the Humber Conservancy Board, the Engineer, Mr. A. E. Butterfield, reported that ' during the year four different channels had existed. It indicated the ever-changing nature of the sands in the Upper Humber by the fact that during the year 77 alterations were made in the positions of lightships and buoys. This was an average of three alterations per fortnight. An interesting feature mentioned was the filling up of a very deep hole which for many years had existed off the north-west corner of Read's Island.

* ' The Songs of a Nature Lover,' by W. Percival Westell. London : Drane's, Ltd. 221 pp., 5/- net.

This hole, which last year had a depth of 49 feet, and in 1919 as much as 74 feet of water at low water, had entirely warped up, and the position it occupied now dries at low water. Reference was also made to the disappearance of the large area of sand which, so far as records show, has always existed to the eastward of Read's Island. This sand, known as the "Old Warp," has been steadily disappearing during the last two or three years, and has now entirely disappeared. The report dealt with the erosion of foreshore which had occurred just west of Brough. Forty-one acres of foreshore in this locality have disappeared since 1911. This is equivalent to a yearly loss of land of nine yards for a distance of nearly two miles. Details were given of the dredging operations carried out during the year, in connection with which $6\frac{1}{2}$ million tons of material have been deposited in the river. Although this huge quantity has been so deposited, yet no appreciable shoaling has occurred in consequence.'

POT-HOLING.

We gather from *The Yorkshire Post* of April 6th that the President of the Yorkshire Ramblers' Club reported that the Club was 'reaching the final stages of the "exploration" of many of the mysterious shafts,' etc. 'Some of them, however, were quite bad enough to require also a supply of determination, considerable agility, and the capacity of resistance to claustrophobia.' (We like the word *claustrophobia*!) 'Taking a census, the author recorded 110 caves and potholes in Ribblesdale and Lonsdale north of Settle; a dozen in Wharfedale, and eight in Nidderdale, though there was reason to believe that the number in Wharfedale was much larger than was at present known. Of this number, 66 would be classed as potholes, which rarely required stiff climbing, but normally the use of a rope-ladder. The rest were mere caves. The real pothole "worthy of the name" must be over 100 feet deep, shaft succeeding to shaft, or pitch to pitch, and was invariably "alive"—that was, a stream occupied the only line of descent. Potholing under these circumstances attracted a *small and select* [thanks be!] body, and one single specimen of a first-class pothole would answer any questioner who inquired why photography and *survey* had remained in the background in comparison with *exploration*. There were, however, very few first-class potholes known remaining unexplored in Yorkshire.' We wish our friends would study the dictionary when using such words as 'survey' and 'explored.'

UNDER INGLEBOROUGH.

From the same journal for April 9th, we learn that 'Visitors to Ingleton this Easter will find a new attraction

of thrilling interest added to the charms of that picturesque mountain village. The existence of a cavern of some sort at the spot has been known for a hundred years. The mouth of it—a little weed-overgrown crack a foot or two in height in the hill side above the Chapel-le-Dale Road, a mile or two from the village—*was, indeed, the very first Yorkshire "geological section" ever published* (sic), and that in the quite early days of the science. Hence geologists have called it "Playfair's Cave," in memory of the keen-witted Scottish professor who interpreted its scientific significance. But neither he nor any of the hundreds of geologists who have plied their hammers in Chapel-le-Dale ever had the courage to pursue its exploration. A dozen yards or so from the entrance the roof of the cavern fell to within a few inches of a *perennial pool of water* of fair depth, and this was an *uninviting barrier*. To the *insatiable curiosity* of Mr. Long and his friend it was, however, a challenge, and they accepted it. *Struggling through* the water they *wriggled on their stomachs* "some" 300 yards through a *more or less* wet crevice rarely more than 18 inches, and often less in height, and they were rewarded by entering a cavern, *some* 18 feet in height, lined with beautiful stalagmitic curtains, and having at one end a fine waterfall.'

TROGLODYTIC BEINGS.

The report goes on: 'For *some* weeks there were rumours in the locality of *mysterious troglodytic beings*—that is not exactly what the dales folk called them, for they thought them "ancient Britons or worse"—creatures, semi-clothed, with *weird, unaccountable lights* in their caps, who flitted at dusk into and out of the hole in the hillside. Eventually, the *mystery was solved* in the announcement that the hole led to such a succession of caverns as even Rip Van Winkle never explored. For the greater part of eighteen months three men, and sometimes more, have been kept busy drilling, *blasting*, and wheel-barrowing away hundreds of tons of debris. It has been a heavy task, for a roadway like a heading of a mine has had to be driven through hard rock—the Ingleton slates or the overlying limestone, to the depth of *some* 300 yards. To a large extent this roadway has followed the windings of the little underground streamlet, which cut the original hollow, but here and there meanders have been short-circuited, and these lengths remain to show the kind of passage through which the original *explorers* travelled. Now the *workers* are on the tip toe of expectations. Last night the foreman of the excavators, Mr. Phillips, concluded that two more charges of blasting powder would clear the last obstacle to the entrance to the cavern. Already a very brisk stream is encountered.'

DR. L. F. SPATH.

II.—ON A NEW DEROCERATID.

AMONG the Ammonites from the Hull Museum sent to the writer there were, in addition to the new form described below, three examples of inner whorls of *Apoderoceras* spp. (group of *A. aculeatum* [Simpson] S. Buckman sp.), with considerable resemblance to *Coeloceras pettos* (Quenstedt). These are similar to the specimens in the Blake Collection, labelled '*Aegoceras grenouillauxi* (d'Orbigny)', and referred to on a previous occasion.¹ As the true *C. pettos* occurs seven zones higher up, great care is necessary in the identification of similar small coronate forms.

Another immature *Deroceras* in Mr. Thompson's collection represents the inner whorls of a larger form, perhaps of the group of *D. miles* (Simpson) S. Buckman.² This was erroneously identified by Blake³ with *D. armatum* (J. Sowerby), but differs in outer whorl, tuberculation, and suture-line, and comes probably from a higher horizon. The true *D. armatum* apparently does not occur in Yorkshire, but more on this point anon.

There was also a tray with immature *Echioceras*, including probably *E. aureolum* (Simpson) S. Buckman and *E. exortum* (Simpson) S. Buckman,⁴ with great resemblance to certain *Microceras* (so-called *subplanicosta*). There has been considerable confusion in the identification of these *Microceras* as well as of *Cruciloboceras*, which are very similar in the young, and of other '*armati*'; and after describing the new ammonite above mentioned, I propose to examine in more detail the horizons of the various Deroceratids, which include so many Yorkshire species.

Genus **Ophideroceras**, gen. nov.

This genus, as type of which is taken the ammonite described and figured below as *O. ziphoides*, sp. nov., is proposed for a group of Deroceratids remarkable on account of their resemblance to the much earlier *Xipheroceras ziphus* (Hehl MS.) Zieten.⁵ Mr. Beeby Thompson⁶ recorded this early

¹ Spath, *loc. cit.* (*Geol. Mag.*, 1923), p. 10.

² 'Yorkshire Type Ammonites,' Vol. I. (1911), Pl. XLIV.

³ In Tate and Blake, *loc. cit.* (1876), p. 277, and in his collection (*e.g.*, B.M., No. C19220).

⁴ 'Yorkshire Type Ammonites,' Vol. I. (1910), Pl. XIX. and (1911), Pl. XXVIII.

⁵ 'Verstein. Württemb.' 1830, p. 6, Pl. V., fig. 2.

⁶ 'Northamptonshire, etc.' *Geology in the Field: Geol. Assoc. Jubil. Vol.*, Part III., (1910), p. 455.

species from the *armatus* zone of Hillmorton, Warwickshire, where it is associated with *Microceras* 'subplanicosta' and 'bifer,' *Crucilobicerass*, *Deroceras*, *Gleviceras* and *Leptechioceras*. These are all forms occurring in the upper half of the *varicostatus* zone, as defined below, but what appear to be true *Bifericeras* (according to Quenstedt confined to a horizon below *oxynotus*) also have been found at Hillmorton.¹ Until the succession is definitely established the horizon of the late Hillmorton 'Bifericeras' that superficially resemble the present genus is thus as doubtful as that of the Yorkshire form



FIG. 1.

Side view of *Ophideroceras ziphoides*, gen. et sp. nov. (natural size), from the Upper Sinemurian (*varicostatus* zone) Hull Museum.

here described.² The outer whorl of the latter tends to develop costation continuous all round the whorl as in *Microceras*, but it is bituberculate as in the micromorph genus *Bifericeras*. The group of *Amm. densinodus* Quenstedt (*Crucilobicerass*)

¹ B.M., Nos. C23268-9, Dibley Coll., preserved in pyrites, unlike the other ammonites, and probably from *oxynotus* zone (see B. Thompson, *loc. cit.*, p. 455).

² Mr. C. Thompson, after seeing the proof, kindly pointed out that the specimen was found in a nodule he dug up from a hard ledge just above the water-level of Mill Beck in Robin Hood's Bay (base of the *varicostatum* zone, according to Tate and Blake's map).

appears to be a close ally of *Ophideroceras* among the *Derocera*-tidæ, and in coarsely-ribbed forms there is a similar tendency to develop ribs continuous across the periphery. The bispinous early *Deroceras* develop subconcave outer whorls, but are related to the present genus by their similar suture-lines.

***Ophideroceras ziphoides*, sp. nov.**

Type.—The specimen in the Hull Museum here figured (text figs. 1, 2a, b.)

SPECIFIC DESCRIPTION.—Coiling polygyral, substenogyral, latumbilicate; venter convex, smooth. Inner whorls not seen. Ornamentation, consisting of distant pairs of tubercles, set on indistinct ribs, about twelve per whorl; the outer projecting laterally as in *Xipheroceras ziphus*.¹ On body-chamber continuous ribs across periphery, with tubercles almost effaced. Suture-line (fig. 2b) with prominent median leaflet in L, and low external lobe.

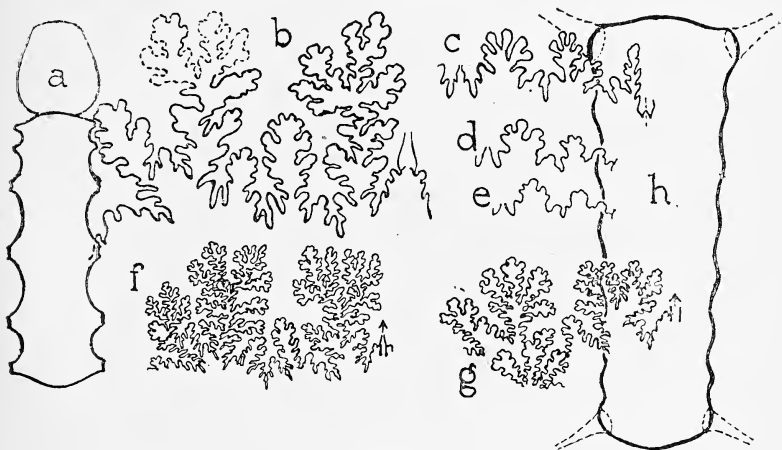


FIG. 2.

(a) Sectional outline ($\times \frac{2}{3}$) and (b) external suture-line ($\times 4$) of *Ophideroceras ziphoides*, gen. et sp. nov. (Text fig. 1); (c-e) Suture-line development of *Crucilobicerases* sp. juv. (Gloucestershire); (c) at diameter of 13 mm. (last suture-line); (d) at diameter of 9 mm.; (e) at diameter of 5.5 mm.; (f) Suture-line of *Crucilobicerases ornatilobatum*, sp. nov. ($\times 3$), Lyme Regis, 'Watch Ammonite Stone'; (g) Suture-line ($\times 3$) of *C. cheltiense*, sp. nov. Hillmorton (B.M., No. C23258); (h) Sectional outline of *Deroceras obesum*, sp. nov. ($\times \frac{2}{3}$) from the *armatus* bed of Lyme Regis.

MEASUREMENTS.—At diameter=50 mm.

Whorl-height	...	22%
Whorl-thickness	...	24%
„ „ (incl. tub.)	...	34%
Umbilicus	...	62%

At 75 mm.

	25%
	20%
(incl. rib)	25%
	64%

¹ See e.g., Quenstedt: *Amm. d. Schwäb. Jura*, 1884, Pl. XXI., fig. 17 (*Amm. armatus sparsinodus*).

OBSERVATIONS.—This ammonite was labelled by Mr. Buckman *Deroceras* sp., and he suggested that it might be *Amm. petricosus* or *Amm. tenuispina* of Simpson. These, however, are nomina nuda, and quite unrecognisable from the descriptions. Young and Bird's *Amm. hastatus*¹ resembles the present species in its distant tuberculation and loose coiling, but it is not bituberculate, and the ornamentation does not degenerate, even at two or three times the diameter of *Ophideroceras ziphoides*. The forms of the much earlier genus *Xipheroceras* are strongly ribbed on the periphery and quite different in larger whorls. *Bifericeras bifer* (Quenstedt)², with similar but closer bituberculate ornamentation, has a different peripheral aspect and less open coiling. True *Bifericeras* develop bituberculation directly on a prolonged smooth stage, but via forms like *B.?* **hugi**, nom. nov. (= *Aegoceras capricornu* Hug.³ non Schlotheim sp.) they are (morphologically) connected with a stock, **Hemimicroceras**, gen. nov. (genotype: *Amm. bifer* Reynès, pars,⁴ non Quenstedt, = *H. thompsoni*, nom. nov.) which includes the Hillmorton (and Honeybourne) '*Bifericeras*,' already referred to, and probably also Emerson's⁵ and perhaps even Hoyer's⁶ '*Amm. bifer*.' These *Hemimicroceras* are often indistinguishable from associated *Microceras*, but take on bituberculation on the outer whorls and have a more complex suture-line. *Hemimicroceras?* *lohbergense* (Emerson),⁷ which grows to a fair size, to judge by Hillmorton examples and allied undescribed forms, also seems to be referable to this genus rather than to *Microceras*. In *Ophideroceras* the development is in the reverse direction, and the resemblance to *Microceras* is confined to the body-chamber.

Large examples of *Crucilobicerias crucilobatum* S. Buckman,⁸ of *C. subdensinodum*, nom. nov. (= *Aegoceras densinodum* Wright⁹ pars, non Quenstedt), and of a new and very coarse

¹ See S. Buckman, 'Yorkshire Type Ammonites,' Vol. II. (1914), Pl. CII. A. and B.

² *Loc. cit.* (1884), Pl. XXII., fig. 7.

³ 'Lias-und Dogger Ammoniten: II. Unter- und Mittellias.—Ammon. Fauna v. Blumensteinalmend, etc.' *Abh. Schweiz. Pal. Ges.*, Vol. XXVI. (1899), p. 30, Pl. VII., figs. 6, 6a.

⁴ *Monogr. des Ammon.*, 1879, Pl. XLIX., fig. 16 only.

⁵ 'Liasmulde von Markoldendorf.' Inaugur. Dissert. Göttingen, 1870, p. 61.

⁶ 'Unt. Lias von Empelde bei Hannover.' *Centralbl. f. Min.*, etc., 1902, p. 35.

⁷ *Loc. cit.* (1870), p. 61, Pl. III., figs. 3, 3a.

⁸ 'Type Ammonites,' Vol. III. (1920), Pl. CLXXVIII.

⁹ *Loc. cit.* (Pal. Soc., 1882), Pl. L., figs. 11-12, probably the same specimen (B.M., No. C1920) as Pl. XXXIX., figs. 6-7. (non figs. 8-9 = *Crucilobicerias crucilobatum* S. Buckman).

species (*C. cheltiense*, sp. nov.,¹ with only 18 ribs to 28 in *C. subdensinodum* at a corresponding diameter) develop body-chambers similar to that of the form here described.

Ophideroceras is included in the family *Deroceratidæ*, but cannot yet be attached to any of the Mediterranean trachyostrous offshoots of *Lytoceratidæ* that produced the successive waves of Deroceratids which are conveniently grouped in a family.

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Disease of Spruce Tree.—There is a curious attack on a spruce tree on this estate. It consists of an exudation of resin of a considerable size invariably at the base of a dead branch or the site of one. In some cases the branch is still on the tree and projects through the resin, which has been formed round it. When cut out the timber appears to be quite normal. Dr. Borthwick states that as far as he knows these swellings have not been investigated, and that he has not come across any cause to which their formation can be assigned, but that it is quite possible mycelium may be present.—J. MAUGHAN.

It is well known that wounding causes the formation of resin cysts and resin canals in conifers, and is known as 'traumatic response.' As Dr. Borthwick suggests, a mycelium might well have entered the wound.—ED.

Hippoboscidae in Yorkshire.—During the winter, Mr. A. Gordon, of Helmsley, sent me a number of parasitic insects, and among them were three species of Hippoboscid flies. The bird fly *Ornithomyia avicularia* Linn. occurred on Tawny Owl, July 23rd, 1924, and on Ring-dove, July 19th, 1924, both of them from Duncombe Park; and the Grouse Fly, *O. lagopodis* Sharp, on Grouse from Helmsley Moor, August 16th, 1924. I have a further record of this species from the moors above Richmond, in Swaledale. Other specimens were also sent by Mr. Gordon from young Merlins, from Bilsdale Moor, Helmsley, July 27th, 1924; these had doubtless reached the birds' bodies from Grouse killed for food. With reference to the Deer fly, *Lipoptena cervi* Linn., previously recorded (*The Naturalist*, 1924, p. 190), Mr. Gordon informs me that in October last he was passing through a patch of grass and bracken where a herd of deer had been lying, when many specimens of the fly lighted on his clothes, and immediately snapped off their wings (*cf.* Sharp, *Cambridge Natural History*, *Insects II.*, p. 518). Mr. J. E. Collins has kindly confirmed the identification of these insects.—GEO. B. WALSH.

¹ Type to be an example (B.M., No. C23258) from Hillmorton, with $1\frac{1}{2}$ whorls of body chamber, characterised by very distant and rursiradiate ribs throughout, but general resemblance to *C. subdensinodum*, n. nov. (see suture-line, text-fig. 2g.).

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The Transactions and Proceedings of the Torquay Natural History Society for 1923-4 contain a valuable series of papers bearing on the area of the society's operations. There are notes on W. Pengelly, by his daughter, and by Prof. Sir William Boyd Dawkins; 'Torquay and Paignton Place Names,' by R. B. Morris; 'Devonshire Sawflies,' by R. C. L. Perkins, and several papers of non-local interest. The publication is well edited and well printed (pp. 101-198).

One basket of oranges was sent from London to Colchester in 1568. This must be a fairly early date for the import of oranges into this country . . . The whale fishery supplied blubber and train oils. Five barrels of rape oil went to London and a quantity of other oil, kind not stated, left Colchester. Four bottles of oil of spike, an essential oil distilled from a foreign variety of lavender, and used in painting, came from London. Zealand sent aniseed, and London liquorice, to Colchester. (*Trans. Essex Arch. Soc.*, Vol. XVII., pt. III.).

In Memoriam.

ROBERT STANDEN, M.Sc.*

RECENTLY there passed away in Manchester, Mr. Robert Standen, M.Sc., Hon. Curator and Ex-President of the Conchological Society of Great Britain and Ireland.

He was the author of most of the non-marine mollusca reports of the Rathlin Island and Ballycastle District Surveys,



his companion and friend, Dr. G. W. Chaster, doing the marine mollusca. The describer, usually jointly with the well-known conchologist, J. Cosmo Melvill, D.Sc., of over 200 shells, mainly marine, from the Pacific Ocean, Persian Gulf, etc., he was well known in zoological circles all over the world. His collection of land and fresh-water shells was well known, and the marine shells, especially the fine cowrie collection, hardly less so.

Few museums have such beautifully arranged collections of shells as Manchester, and this was Mr. Standen's work. His fine sections of univalve shells to show the columella and spiral arrangement inside, and of bivalves, so as to show

* From *The Belfast Telegraph*, March 23rd.

the interlocked hinges of the valves, have no equal. He was the inventor of the method of sectioning, so that the most delicate internal structure would not be damaged.

His arrangement of the ethnographic collection, in the same museum, is well known to all specialists in that branch of science who have seen it as one of the most perfect of its kind in Britain. He did not crowd the cases, as in most museums. Every object is displayed to best advantage, and for every example in the cases there are several others stored away till additions are made to the building.

Mr. Standen was one of the founders, and often contributed to *The Lancashire and Cheshire Naturalist* important papers on various zoological subjects, and for many years contributed papers or short notes to *The Irish Naturalist*, *The Journal of Conchology*, etc.

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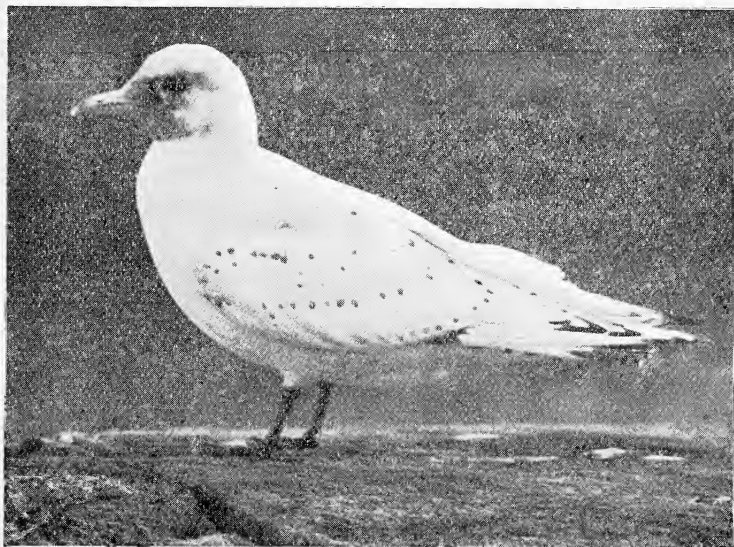
Demoiselle Crane at Robin Hood's Bay.—An adult female Demoiselle Crane was shot at Robin Hood's Bay on July 5th, 1924. Mr. W. H. St. Quintin has made many enquiries among gentlemen in this country and on the Continent who keep this species in confinement, but he has failed to hear of any birds having been lost. One which escaped from Foxwarren Park, Surrey, about three and a half years ago, was said to be a male.—F. SNOWDON.

Waldheimia cranium Müller in Holsteinborg, West Greenland.—Among a number of *Chlamys islandicus* Müller from Holsteinborg, sent by Mr. John Möller, of Godthaab, Greenland, I found a perfect specimen of the remarkable Brachiopod *Waldheimia cranium* Müller, a species which, according to Posselt's 'Grönland's Brachiopoder og Blöddyr,' 1898, p. 7-8, is very rare on the west coast of Greenland, having only been observed in three specimens by the Swedish 'Sofia' Expedition, 1871, at Julianehaab (60° 43'), and in the Davis Straits (Wallich), but Holsteinborg is situated on 66° 56' N. lat. On the East coast, however, it is recorded from outside S.E. Greenland's coast by the Swedish Expedition, 1883, and by Moebius from Shannon Island (75°-75° 30'). *Waldheimia cranium* Müller belongs to the widespread circumpolar species recorded from various places from the North-east coast of North America, Iceland, Spitzbergen, Farö Islands, Norway, Shetlands, England, France, Portugal (Vigo), North coast of Asia and Japan. Further, it is described from the post-tertiary deposits of Norway and Sweden (Uddevalla) and the Pliocene of Sicily (Messina). I have presented to the Swedish State Museum in Stockholm the specimen from Holsteinborg.—HANS SCHLESCH.

IVORY GULL AT WHITBY.

F. SNOWDON.

ON March 2nd, Mr. A. S. Frank saw an immature Ivory Gull about the outer harbour. The following day Mr. J. H. Wilson and I satisfied ourselves that Mr. Frank's identification was correct. The bird remained about the harbour during the next five days. It seldom settled on the water, but often flew about the harbour, returning shortly to one or other of its favourite resting places. No disposition was shown to



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Ivory Gull.

[F. M. Sutcliffe, Sleights.

associate with the local gulls, from which it always kept apart, spending most of the time sitting on the end of one of the piers. Except on one occasion, when a young Herring Gull disturbed it, I did not see the other gulls interfere with it or 'mob' it as they usually do a stranger. The flight of the bird resembled that of a Common Gull, rather than being tern-like, as described by some writers. None of our local observers heard the call. When first seen, our visitor appeared to be suffering from some injury: it exhibited in a marked degree that lack of shyness which Selby stated had been noticed by observers of this species, and several times it flew on to the pier and carried away the bait of an angler fishing close by. Food thrown down to it was eagerly seized and

swallowed. Unfortunately the extraordinary tameness shown by the bird led to its undoing, as it was captured by a young fisherman on March 7th. It did not live long in captivity, and it was eventually acquired by the Whitby Literary and Philosophical Society, for whom the skin has been preserved and set up by Mr. J. H. Wilson, the veteran naturalist. Mr. Wilson found the bird to be a male, and from the amount of black on the outer primaries, the heavily-marked greater wing coverts and the bar on the tail, which is more than an inch broad, he concluded it was one of last year.

The body was much emaciated, and in the gullet was a rusty haddock hook, which no doubt accounted for the bird's sickly condition. The weight was 16½ ounces. While the bird was frequenting the piers, Mr. Frank M. Sutcliffe was able to secure a very successful photograph.

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A BRONZE-AGE EARTHENWARE VESSEL.

IN visiting a well-known dealer's premises in London the other day, I was surprised to see an important Bronze-age beaker or 'drinking cup,' the somewhat unusual ornamentation of which at once appealed to me, as in connection with my work on Mortimer's 'Forty Years' Researches' some years ago I had made particular comparisons with the illustration of this identical vessel. I found that it had been purchased at a public sale a little while ago, and although with it was found a small bronze implement and a perforated hammer, these did not appear to have been at the sale in question, and possibly are lost. Their present whereabouts are unknown to the Rev. E. H. Goddard, who has an extensive knowledge of Wiltshire antiquities.

In Thurnam's excellent account of 'Ancient British Barrows,' appearing in *Archæologia*, Vol. XLIII., 1871, he classifies the various forms of earthenware vessels found in the burial mounds, and under the heading 'Drinking Cups' (page 388) states: 'The most handsome of the fictile vases of Ancient Britain are the drinking cups. They are usually tall vessels of seven or eight inches in height, thin and well-baked, made from clay tempered with sand or finely pounded stone, the colour varying from a light brown to a somewhat bright red. The general capacity is from two to three pints, though a very few contain less than one, and the others as much as four pints. The ornamentation is profuse; the surface, covered with markings incised or punctured, symmetrically arranged in horizontal bands, which, in the more ornate, alternate with square, oblong or chequer-shaped compartments, placed vertically or obliquely, and variously filled

in, sometimes, as in the fine specimen from East Kennet, with a large saltire or St. Andrew's cross (Fig. 83).’ It will thus be seen that in his introductory remarks to his account of some scores of drinking cups, he specially mentions this East Kennet discovery, the figure 83 in question being that reproduced herewith.



Bronze-age Beaker from East Kennet.

In Abercromby's 'Bronze Age Pottery of Great Britain,' Vol. I., 1912, is a summary of objects found with beaker interments, from which it would appear that with this particular beaker was found a stone axe-hammer and a knife-dagger. The figure of the knife-dagger given on plate LIX. (No. O.6) of Abercromby's work shows this to have been of the usual round-ended variety, which had been fastened to a handle by means of three rivets. Its measurements were $5\frac{1}{2}$ ins. by $2\frac{3}{8}$ ins.

Lord Abercromby figured the East Kennet beaker on Plate V. of his work, being the first plate devoted to English beakers. An excellent figure of the bronze knife-dagger found with this beaker appears in *Archæologia*, Vol. XLIII. (1873), page 452. From a record of a meeting of the Society of Antiquaries for May 13th, 1869,* we gather that the Hon. Mrs. Denison exhibited, from East Kennet, Wilts., 'from a small barrow west of the long barrow (called by Stukeley the Long Arch-Druid's Barrow) opened in 1840, a vase . . . a fine hammer of stone, and a bronze dagger $5\frac{1}{4}$ inches long, with tang pierced for three rivets which remain *in situ*.'

Evans (*Ancient Stone Implements*, p. 193) says the East Kennet stone implement is an axe-head with a cutting edge at one end only, the shaft-hole being near the other end, which is rounded. It was 'formed from a beautifully veined stone,' and a similar implement from the Wear in Sunderland, 'now in the Newcastle Museum,' is figured.

Illustrations of the vase, dagger and axe appear in the 'Salisbury' volume of *The Proceedings of the Archæological Institute*, 1849, p. 110.

The vase is $7\frac{1}{2}$ ins. in height, and can now be seen in the Hull Museum.—T.S.

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Reminiscences of Kenwood and the Northern Heights, by Sir Arthur Crosfield. London: 'Country Life.' 32 pp., 5s. Now that Kenwood has been secured for the nation, Sir Arthur Crosfield's 'Reminiscences' are particularly useful, and the charming illustrations accompanying this volume will help to make all lovers of the countryside the more grateful to those who secured this oasis for the nation for all time.

Nature Studies of a Boy Naturalist, by C. T. Astley Maberly. London: T. Fisher Unwin, Ltd. 141 pp., 6s. net. In his introduction to this volume Mr. Edward Step states:—'The Boy "Naturalist," to whom we are indebted for this volume of vivid glimpses of Nature, is no mere impressionist, but in spite of his youth a well-informed observer, whose study has taught him to look for interesting things. He takes us to the Downland, the woods, the saltings or the estuary flats, with a knowledge of the creatures that haunt these severally, and so is able to distinguish between the species of gulls or waders or hawks or finches, and to mark the characteristic behaviours of each.' We give Mr. Step's opinion of the volume as authoritative;.

A Text-book of Biology, by W. M. Smallwood. London: Bailliere, Tindall & Cox. 393 pp., 16s. net. By the aid of a wealth of illustrations (over 250, some coloured) Smallwood's Text-book of Biology again makes its appearance, this being the 5th edition, which speaks well for the popularity of the volume. The author has brought the work up to date, and those who have not already made themselves acquainted with the book are advised to do so. The first part deals with 'The Fundamental Principles of Biology as illustrated by a Complex Animal—The Frog'; the second part, 'The Fundamental Principles of Biology as illustrated by Unicellular Organisms'; the third, 'Plant and Animal Types illustrating Biological Principles'; and the fourth, 'Theoretical Interpretations.'

* *Proceedings*, II. Series, Vol. IV., pp. 339-340.

THE RHODESIAN SKULL.

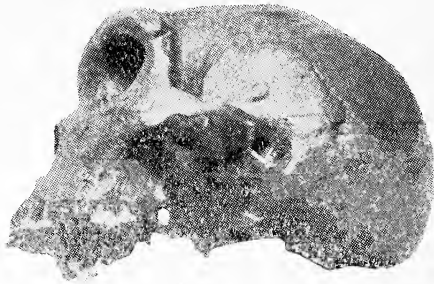
THROUGH the courtesy of the authorities at the British Museum a magnificent cast of the Rhodesian Skull has just been added to the fine series of casts and reproductions, as well as of actual prehistoric human skulls, exhibited in the Municipal Museum at Hull. The skull figured herewith was obtained from a cave at Broken Hill in Rhodesia, and was found in association with rude stone and bone implements, and large quantities of broken bones, evidently remains of food of men and flesh-eating animals who have at different times occupied the cave. In association with this human skull, which



occurred in a remote part of the cave, other human bones were found.* 'As shown in the accompanying photograph, it is strangely similar to the skull of Neanderthal or Mousterian race found in the caves of Belgium, France and Gibraltar. Its brain-case is typically human, with a wall no thicker than that of the average European, and its capacity is obviously well above the lower human limit. Its large and heavy face is even more Simian in appearance than that of Neanderthal man, the great inflated brow-ridges being especially prominent and prolonged to a greater extent at the lateral angles. The roof of the skull at first appears remarkably similar to that of *Pithecanthropus* from Java, having the same slight median longitudinal ridge along the frontals, and rising to its greatest

* See Sir Arthur Smith Woodward, *Nature*, Nov. 17th, 1921.

height just about the coronal suture. It is, however, very much larger, and the resemblance may not imply any close affinity. The palate is of enormous size, as large as that inferred by Boule from the fragments preserved in the La Chapelle skull. It is, however, in all respects human, being deeply arched and bounded by the horse-shoe-shaped row of teeth, which are unusually large, but also entirely human. The teeth are much worn, and those of the front of the jaw met their lower opposing teeth in the primitive way, edge to edge. The canines are not enlarged. The lower jaw is unfortunately absent, but the size of the palate and the extent of the temporal fossæ show that it must have been massive. Even the Heidelberg jaw is slightly narrower and



shorter than this must have been.' Sir Arthur Smith Woodward recognises in the Rhodesian cave-man a new form specifically distinct from *Homo neanderthalensis*, and it may appropriately be named *Homo rhodesiensis*.

We may add that the reproduction, made by Messrs. Damon & Co., is the finest piece of coloured plaster work that we have seen for some time.—T.S.

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Grey Squirrels at Jervaulx, Yorks.—Referring to recent reports respecting the Grey Squirrel, the species is quite common here, and appears to have routed the native squirrel, as I have not seen one for some time.—J. MAUGHAN.

***Riccia glauca* in Cumberland.**—While turning over some bare soil in my garden at Kelsick, last November, I found a single rosette of this uncommon Hepatic. It was in good fruit, having numerous black sporangia lying immersed in the thallus. I measured several spores with the eye-piece micrometer, and found them to vary from 80 to 90 μ in diameter. It is not given for V.C. 70 in the Census Catalogue.—JAS. MURRAY, Kelsick, Wigton.

VERTEBRATE ZOOLOGY IN YORKSHIRE.

E. W. TAYLOR.

A MEETING of the Vertebrate Section of the Yorkshire Naturalists' Union was held in the Library of the Leeds Philosophical Society on Saturday, February 21st, Mr. F. H. Edmondson presiding. It was preceded by a meeting of the Yorkshire Wild Birds and Eggs Protection Acts Committee, Mr. H. B. Booth occupying the chair.

Mr. Edmondson reported briefly on the decisions made regarding bird watchers for 1925.

Mr. Booth exhibited photographs of the Great-crested Grebe obtained by Dr. Heatherly on the Norfolk Broads, and Mr. R. Chislett showed a nest of the Icterine Warbler. He said that the song of this bird was equal to that of the Nightingale in volume, but was rambling and disconnected.

Mr. Rosse Butterfield reported that immense flocks of Starlings were roosting in the rhododendrons around Bleak House, Cullingworth, and estimated their numbers as between two and three hundred thousand. He examined the crops of nineteen birds, shot at a single discharge, and found them to contain shells, beetles, parasitic worms and large quantities of leather jackets—99 of the last named being found in a single crop.

Mr. Booth thought that the flocks had delayed departure owing to the fine weather, and that several had combined. Starlings were scarcer than usual at Ben Rhydding.

Mr. Booth read an extract from *The Field*, in which Mr. Mortimer Batten stated that the Wild Cat was now confined to that part of Scotland north of the Caledonian Canal, and in which Mr. H. W. Robinson had replied stating that it was still found in Argyleshire, and that a pair had bred in Westmorland, regarding which he gave particulars. Mr. Booth thought the evidence regarding the Wild Cat in Westmorland should be followed up, and that possibly they had been liberated in the Lake District. Mr. C. F. Procter described the characteristics of the true Wild Cat, but Mr. Booth quoted Mr. A. H. Cocks, who had made a special study of this animal, as stating that in certain cases it was impossible to distinguish between the true Wild Cat and the domestic cat run wild. It seemed desirable to regard the alleged Westmorland Wild Cats as escapes, pending further information.

Mr. Procter read a paper on 'Animal Psychology' and described his subject as one limited to the use of speculation and deduction only. The great French naturalist, M. J. H. Fabre, was described as a pioneer in this line of investigation, and his work had laid bare many obscure processes in the life histories of insects, and incidently presented several new unsolved problems for every one he had solved. The word 'instinct' was generally used to explain any problem of animal thought, and its general meaning is one of blind obedience to certain conscious promptings of an unconscious ego—experience without experience—memory without the possibility of having acquired it. While it is not difficult to define acts of instinct and acts of reason, the two cannot be separated by any arbitrary boundary, and the development of reasoned intelligence has been, in the case of man, at the expense of instinct. The author grouped the problems of Animal Psychology under four heads:—

(a) Phenomena related to unconscious promptings, such as migration and similar unreasoned acts, which appear to be the result of individual experience, and yet cannot be.

(b) Matters connected with parentage and its immediate duties.

(c) Evidences of reasoned thought as applied to the chance happenings of animal communities and individuals.

(d) Animal crime and problems of sex.

The long series of investigations conducted by Mendel culminated in a close code of laws and affinities which have reduced the artificial

direction of heredity to something approaching a science, and later discoveries have shown that when form and environment are not in harmony, busy little 'harmones' set to work to restore harmony. It even appears that congenital characteristics are transmitted to the offspring with even greater regularity than are the physical. Man comes into the world with a clean memory in which must be stored for future use the accumulated knowledge of teachers and parents, but it should not be more difficult to believe that animals are born with stored and inherited memories than it is to believe that they are born with inherited vices or virtues, as indeed they are. The mystery of the Lemmings march, the Swallows initial migration and much that we loosely term instinct, all point in this direction without resource to a sixth or seventh sense. Nature has only one aim respecting parentage and that is to ensure the propagation of the species even at the expense of comfort, safety and life itself—it would be idle to place this on the plane of reason. Ages of evolution have eliminated attributes which were not in harmony, but the driving force which ensured involuntary obedience to the laws governing propagation was always maintained. This force drives the Salmon from the realms of plenty to endure starvation in our rivers in order to produce offspring that he never sees, and wild animals to wander far in search of mates.

Regarding reasoned thought, many must have marvelled at the concerted action displayed by a flock of Dunlin. To observe them disappear and reappear as if by magic, as they simultaneously turn in their flight makes the observer wonder how this movement is executed, and at what signal. What impulse caused a blindfold sheep to jump a net it could not see in order to rejoin the flock, unless it was communal thought? There is, in fact, every evidence that communal thought is general among massed animals, and perhaps a form of telepathy guides the male emperor moths to the unfertilised female, the vultures to the recently discovered carcase, and explains the combination among a pack of wolves. Evidence of the survival of this power is well known in the case of man acting under the influence of an excited crowd of his fellows. Crime among animals in the sense of a deliberate breach of the laws of the community is almost unknown. Theft is a recognised crime, but the equivalent of manslaughter among animals is almost always a clean impartial test of strength for the love of a mate, and it is only man who ever kills his female. In the conjugal state the relations between the sexes are, in the animal world, almost perfect, and a very rigid code is observed. No doubt the elimination of all but the fit tends to this—degenerates only being permitted to survive in human society.

A paper was read by Mr. W. G. Bramley on 'Animal Legends,' and examples were given relating to the Salmon, Rat, Squirrel, Economic Campagnol, Cat, Lion, Weasel, Shrew, Partridge and Magpie.

In Goldsmith's 'Animated Nature' it is stated regarding the Leeming that 'If at last the leader be forced out of its line, which it defends as long as it can, and separated from the rest of its kind, it sets up a plaintive cry, differing from that of anger, and, as some pretend to say, gives itself a voluntary death by hanging itself in the fork of a tree.'

Incantations for the banishment of rats have been known from the twelfth century at least, and have been practiced in Scotland and Ireland up to quite recent times. They are peculiar in that the destruction of the rats is not desired, but that they are required to take up their residence in some place named which is generally situated some distance away, and separated by a river or some natural barrier. In Ireland it was customary to pin the incantation to the barn door for the king of the rats to read.

It is stated in Grew's 'Rarities of the Royal Society' that 'The Squirrel, when he hath a mind to cross any water for a good nut tree, picks out and sits on some light piece of bark for a boat, and erecting his tail for a

sail, he makes his voyage. Other instances from old 'natural history' works were cited.

At the evening meeting a paper was read by Mr. T. M. Fowler entitled 'Some of our Rarer British Breeding Birds,' illustrated by a large number of beautiful slides from the author's negatives. The first species dealt with was the Great-spotted Woodpecker, and the nesting hole was in a silver birch tree festooned with fungoid growths. A very fine photograph of the Hen Harrier at the nest was obtained in the Orkneys, on a particular island that seems specially attractive to this species, probably because of the abundance of the Orkney vole, on which it feeds. The number of pairs nesting on this island is very variable, and while none was seen one year, four pairs were nesting in the following year. Patches of deep heather interspersed with reeds formed the nesting site in all cases. Several photographs of the Fulmer Petrel were shown, some of which were obtained in the neighbourhood of a little ruined Church where several birds were nesting, and could not be induced to take wing.

The lecturer thought the Fulmar Petrel an extremely stupid bird, and marvelled that it should exist in greater numbers than any other species, especially as it only laid a single egg. In some cases its stupidity was an undoubted asset, as when disturbed, the Guillemots and other bird would rise from their nesting ledges and frequently roll their eggs off the face of the cliff, while the Fulmar was far too unconcerned to leave its nest, and consequently suffered no loss from this cause. Photographs were also shown of a Fulmar sitting on a nest built in the thatch of a crofter's cottage.

The species next dealt with were the Sandwich Tern, Lesser Tern, Jay and Nuthatch, photographs of the latter being obtained in Suffolk.

A very fine photograph of the Crossbill on its nest was obtained in Scotland, and was much appreciated owing both to the rarity of the species and the very difficult situation of the nest. The nest was a very loose structure, and the eggs closely resembled those of the Greenfinch.

The Yellow Wagtail, Great Skua, Reed and Sedge Warblers, Great-crested Grebe, and Water Rail were next dealt with, and a photograph of a Bittern's nest, obtained in Norfolk, was shown. Photographs of the Red-necked Phalarope, Red-breasted Merganser, Dunlin, Chiffchaff, Short-eared Owl and Nightjar concluded a beautifully illustrated paper.

Mr. H. B. Booth read a paper entitled 'Salmon Sunday at Paythorne Bridge,' which he described as a 'feast' of long standing. It is held on the Sunday nearest to November 20th in each year, and hundreds of people congregate at or near the bridge. Paythorne Bridge is on the Ribble, mid-way between Hellifield and Gisburn, and about half a mile from Newsholme Railway Station; the actual spawning beds of the Salmon are in the immediate vicinity. Last year the date was November 22nd, when the author arrived there in a deluge of rain, and found the Ribble bank high, and so coloured that nothing could be seen. A week later the river had fallen, and was little above its usual level. Several large Salmon were seen in the gravelly reaches engaged in 'Cleaning the Gravel' preparatory to spawning or 'Redding.' They worked with the anterior underpart of their bodies in the gravel, and were in water about 30 inches deep; the dorsal fin and upper flakes of the tail were frequently out of water. The author was told that when 'Redding' during the evening and night, the gravel is thrown with such violence that the noise can be plainly heard by a person on the bank. It was generally agreed that there were more fish in the river than for many years past. A sick Salmon with an arched back and a fungoid growth was seen working its way up the river, close to the bank, in order to avoid the strong current. It was observed to do a little cleaning and 'redding' in about six inches of water, close to the bank; it then slid out into the current and was carried down to repeat the process later.

The determination and pertinacity of this fish served to show how insistent was the call of nature.

A discussion followed, in which Mr. Greevz Fysher described the spawning of toads, Mr. Edmondson the way in which the trout in a stream fight, and Mr. Taylor the spawning of Salmon in the Murk Esk, a tributary of the Yorkshire Esk

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A second edition of the interesting pamphlet issued by the British Museum (Natural History) entitled **Furniture Beetles: Their Life-history and how to check or prevent the damage caused by the worm**, by Charles J. Graham (24 pp., 6d.) has been called for.

The Roman Toga, by Lillian M. Wilson. Baltimore: The John Hopkins Press. 132 pp., \$5. As No. 1 of its 'Studies in Archaeology,' The John Hopkins Press, U.S.A., has published this valuable contribution to Roman Antiquities, by Dr. Wilson. The author gives illustrations of this dress from various mosaics, wall paintings, statues, etc., and by dressing modern people in Togas has very graphically reproduced the method of wearing these peculiar robes. She also gives illustrations of the construction of the Toga.

Leçons de Pétrographie, by Jacques de Lapparent. Paris: Masson & Cie. xix.+501 pp., 60 francs net. All students interested in the structure of rocks will be familiar with the excellent work which has been accomplished by the Professor of Geology at the University of Strasbourg, and the fine volume which has appeared under his name will be a lasting memorial to his industry. With the aid of 120 figures in the text and 28 coloured plates prepared by the chromo-graphic process, the Professor gives an admirable introduction to the study of Petrography, dealing with both sedimentary and igneous rocks. While the volume is written in French, the language has been so carefully chosen and his sentences are so exceedingly lucid, that students with even a small knowledge of the French language will be able to follow his description quite clearly.

Prehistory: A Study of Early Cultures in Europe and the Mediterranean Basin, by M. C. Burkitt. London: Cambridge University Press. xxvi.+438 pp., 35s. net. In our volume for 1921 we gave a review of this book, and particularly complimented the author on the cautious attitude he had taken up in discussing the various collections which he had personally visited on the Continent, and their significance. It is satisfactory to find that already a second edition of this work has been called for, and notwithstanding many alleged important archaeological discoveries which have been made during the past few years, there is a welcome absence of some of the more startling of these, and others are given in the necessary prospective. On consulting the Index we were quite delighted to find the absence of the names of certain recent and voluminous writers.

Useful Aspects of Geology, by S. J. Shand. London: T. Murby & Co. x.+197 pp., 7s. 6d. net. The author's object in the preparation of this book can best be explained in his own words: 'This book is offered to the large class of people who have never picked up any systematic knowledge of geology, and who are interested, whether as landowners, shareholders, prospectors, engineers, builders, miners, farmers, or perhaps as lookers-on, in one or other of the many undertakings that depend for their success on the application of geology. . . . There were two lions in my path. One of them was the danger of making the subject so difficult as to repel the very class of reader that I wished to attract; the other, that of reducing the matter to such simple terms as to have no real value at all.' He deals with Geological Age, Structure, Composition of Rocks, Mineral Deposits, Weathering, Soils, Rocks as Building Materials, Water-Finding, Oil Geology, and Engineering Problems. His remarks on Water-Finding are particularly useful.

NEWS FROM THE MAGAZINES.

J. Edwards writes on 'A *Deltocephalus* hitherto unrecorded for Britain,' in *The Entomologist's Monthly Magazine* for March.

'The Downy Mildew of the Hop,' by E. S. Salmon and W. M. Ware, appears in *The Journal of the Ministry of Agriculture* for April.

'Habits of the Sea-Slater, *Ligia oceanica*,' by Prof. J. Tait, and 'The Starling in the Forth Area,' by the late W. Evans, occur in *The Scottish Naturalist*, No. 151.

E. G. R. Waters gives 'Three Additions to the British List of Tineina,' and J. Edwards '*Miris trispinosum* Reuter, a British species,' in *The Entomologist's Monthly Magazine* for April.

In *The Bryologist* for November last appears 'William Henry Pearson—a Bibliography,' by Herbert C. Broome. Pearson's first contribution was on Yorkshire Hepaticae in *The Naturalist* (1876, pp. 167-168). The Bibliography occupies six pages.

The New Phytologist for March includes several important papers dealing with foreign botany; J. H. Priestley and A. Wormall have 'A Cytological Study of Pollen Development in *Nolana*,' and S. M. Wadham gives 'Observations on Clover Rot.'

No fewer than 18,189 birds were ringed in 1924 in connexion with the *British Birds* marking scheme, making a total of 145,779 ringed since the scheme started in 1909. Interesting details of the results of this work are given in *British Birds* for March.

Prof. J. L. Myres contributes 'Historical Methods of Ethnology' and 'Wayside Geography,' Miss W. B. Medway 'Learning Geography by Drawing,' and E. Young 'Geography in Elementary Schools' to the spring number of *The Geographical Teacher*.

J. Delacour writes on 'Wagtails and Pipits,' and P. F. M. Galloway on 'How to keep Insectivorous Birds in perfect Condition,' in *The Avicultural Magazine* for February; and articles on 'Warblers and Small Indigenous Turdidae,' 'The Tree-creepers, Nuthatches and Wrens,' appear in that journal for March.

Mr. J. W. Jackson's Presidential Address on 'The Distribution of *Margaritana margaritifera* in the British Isles,' appears in *The Journal of Conchology* for March. From the accompanying map it would appear that the three localities for the freshwater pearl mussel, occurring in North Yorkshire, are the most southerly records of this species for the east of England; Wales, Cornwall and Devon containing the only records south of Yorkshire.

Owing to the unfortunate illness of the editor, *The Vasculum* for January appeared late. Its contents are varied, and include 'The First English in Northumberland,' by W. G. Collingwood; 'Alien Plants,' by Dr. B. M. Griffiths; 'A Basaltic Crag in Spring,' and 'Roman Stations in the North,' both by J. E. Hull; 'The Larch "Blight,"' by C. Robson; 'Birds in Upper Redesdale,' by R. Craigs; 'An Abnormal Specimen of the Blue Spruce,' by Dr. K. B. Blackburn. By the way, Dr. Blackburn gives the title of her paper 'A Few Notes on,' which might equally reasonably have been added to the title of every note in the journal.

Science Progress for April, edited by Sir Ronald Ross (who is now assisted by D. O. Wood and Prof. J. B. Gatenby) contains, besides the usual reviews of current scientific progress, 'The Electron as a Key to Atomic Structure,' by Ann C. Davies, 'The Form and Function of the Golgi Apparatus,' by L. A. Harvey; 'The Field for Research in the Flour-Milling Industry,' by E. A. Fisher, 'Thomas Beddoes, a neglected Chemist,' by T. W. Jones; 'The British Museum, East Africa Expedition,' by L. S. B. Leakey; 'Feeding in Public Schools,' by G. E. Friend; 'The Present Position of Biology among the Sciences,' by J. W. Woodger; and 'The Sun and the Weather,' by E. V. Newnham.

NORTHERN NEWS.

The death is announced of Prof. A. Dendy, F.R.S., aged 60, a leading authority on sponges.

Mrs. Margaret Alice Dalton-Burgess died in December and left her stuffed birds to the Bristol Museum.

A certain London publisher asks us for Mr. Sheppard's paper on 'A Mangled Nose Harpoon'! Possibly the Maglemose's nose is a bit out of joint by now!

'The Cult of the Dead in Prehistoric Times,' by Rev. E. O. Jones, is the title of a paper in *The Berks., Bucks., and Oxon Archæological Journal* (Vol. XXVIII., No. 1).

A new magazine, 'The Antiquarian Quarterly,' incorporating articles on archaeology and ancient art, made its appearance in March. It is well illustrated, and published by Messrs. Spink & Son, King Street, St. James', London, at 2/6 each part.

The death is announced of E. B. Chamberlain, Secretary of the Sullivant Moss Society. He died in New York City on February 2nd from pneumonia contracted while watching the solar eclipse last January. He was head master in a Science School in New York, and one of the kindest of men.

Volume XXII. of *The Journal of the Northants Natural History and Field Club*, besides numerous antiquarian matters, contains 'Witchcraft in Northamptonshire,' by A. Adcock, 'The Northampton Sand,' by Beely Thompson, 'Meteorological Notes,' by C. A. Markham, and an Obituary Notice (with portrait) of the Hon. N. C. Rothschild, by G. Claridge Druce.

Hull Museum Publication, No. 139, contains articles on England's first Commercial and Transport Museum, reprinted from *The Museums Journal*, and various papers on Prehistoric Man, Rare Geological and Zoological Specimens, and a Bronze Age Earthenware Vessel, reprinted from *The Naturalist*. The frontispiece shows a view of the new Museum of Commerce and Transport.

One of the Sunday illustrated papers recently gave large reproductions of photographs of the plover and the black-headed gull. They are headed 'Feathered Rivals in Epicure's Favour,' and we are assured the eggs of the black-headed gull are frequently sold as those of the plover. Presumably the same 'epicures' would be quite unaware of the 'deception' if a swan's egg were served up to them described as a hen's egg!

We see from a Bill to provide for the Further Protection of Birds (15 Geo. 5), it is enacted that it is an offence to decoy birds or use bird lime or similar substances. Similarly it is illegal to keep birds in cages which are too small. Persons guilty of offences against the Act shall be liable to a fine of £25, or alternatively or in addition, imprisonment, with or without hard labour, for three months. The Act does not apply to Northern Ireland.

Volume XXXVII. of *The Proceedings and Transactions of the Liverpool Biological Society* represents the first publication of this useful society which does not show the guiding hand of Prof. Sir William Herdman, the first words in the volume recording his death, with every regret: Prof. W. J. Dakin follows with his inaugural address on 'The Teaching of Biology in Secondary Schools.' Prof. J. Johnstone then gives the 37th annual report of the Marine Biological Station at Port Erin. E. C. Herdman contributes 'Notes on Dinoflagellates and other organisms causing discolouration of the sand at Port Erin; W. J. Vernadsky pleads for the establishment of a Bio-geochemical laboratory; Dr. Dakin gives a Note on the Function of the Water Vascular system of echinoderms; Prof. Johnstone follows with his Report on the Investigations carried on in 1923 in connexion with the Lancashire Sea-fisheries laboratory at the University of Liverpool, and the Sea-fish hatchery at Piel, near Barrow, with contributions by A. Scott, W. C. Smith, W. Birtwistle and H. M. Lewis. Altogether it is an excellent publication.

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NOTES AND COMMENTS.

THORBURN'S BRITISH BIRDS.*

Thorburn's inimitable sketches doubtless make still another work on British Birds possible, albeit it is not an expensive publication. Messrs. Longman's previous experience, however, apparently justifies them in placing on the market still another work dealing with bird life. The first volume of this new edition contains 48 coloured plates, each of which includes representations of one or two species. The plates will certainly sell the book, and the publishers kindly enable us to reproduce one of them herewith as Plate V. This work originally appeared in 1915, though on a larger scale, and in the present smaller edition the pictures are new and the letterpress has been considerably revised.

A 'YORKSHIRE WELCOME'?

Recently a Conference in connection with the Royal Microscopical Society was held at the University, Sheffield, and at this were read various papers bearing upon the different directions of microscopical research, from stained preparations of Rotifers, Cytology of Cancer, to microscopical examination of refractory materials, and the structure of paper-making fibres. The conference covered three days, and was held at Sheffield, presumably partly in honour of the fact that it was Sorby's city, the late Dr. Sorby, who was so intimately connected with the Yorkshire Naturalists' Union, and was once its President, being a pioneer in many lines of microscopical research. Unfortunately our microscopists have somewhat microscopical ideas with regard to organising Conferences, and apparently it had not occurred to them that in connexion with a conference of this sort it might be of mutual advantage to invite representatives from the local scientific societies and from the county society. For a Conference of this character to be held in Yorkshire without representatives of the Yorkshire Naturalists' Union being invited seems almost unbelievable, especially when we examine the list of societies which have been asked to send delegates.

CARDAMINE PRATENSIS.

At a recent meeting of the Manchester Literary and Philosophical Society, Dr. W. Robinson read a paper: 'On proliferation and doubling in the flowers of *Cardamine pratensis* L. Specimens of *C. pratensis* showing two main types of abnormality were found in meadows near Cheadle Hulme, Cheshire, in June, 1923, one of which was similar to the double-flowered form, arising by proliferation of the ovary, described most frequently by previous observers, and the

* 'British Birds,' by Archibald Thorburn. London: Longmans, Green & Co. xx. + 176 pp., 16/- net.

other, a less completely double-flowered specimen. Microscopic investigation showed that, in both types, proliferation took place by the meristematic activity of a growing-point at the base of the ovary, of a flower which was otherwise normal. In one case, however, the ovary itself was carried up on a stalk produced by the growth activity of tissues immediately below the base of the ovary, but outside this; in the other specimen all the growth took place within the ovary from the base of this, and the meristematic growing-point was carried up to about the middle of the pod-like structure. The doubling seen in *C. pratensis* has recently been spoken of as a mutation from the more normal single form, but Goebel has stated that by cultivating plants of the double form in sandy soil they completely lost the character. By vegetative multiplication from the original specimens collected wild at Cheadle Hulme, it has been possible to cultivate plants showing variations, both in the character and degree of the doubling. Further work will show whether the plasticity of *C. pratensis* is such that doubling can be produced under experimental conditions in a single-flowered form by nutritional changes, as Goebel has suggested, or whether, as seems more likely, the double-flowered and single-flowered forms are two different races with distinct hereditary complexes.

THE GEOLOGICAL SURVEY AND MUSEUM.*

The forthcoming removal to South Kensington of the magnificent collection of minerals, rocks and fossils, to say nothing of the library, now housed at 28 Jermyn Street, Piccadilly, is from many points of view to be regretted. From the official standpoint it may not matter much where the central office of the Geological Survey is situated; but to the public the question is mainly one of accessibility. South Kensington, in this respect, is rather outside the beaten track, although in these days of rapid transit by tube, or otherwise, the objection to the removal has less force than formerly. The Jermyn Street site, moreover, has many memories of past associations.

THE ROMANCE OF FUNGUS LIFE.†

Those on intimate terms with the Fungi are well aware of the halo of romance which surrounds these curious products of plant life, but it has been left to Messrs. R. T. and F. W. Rolfe to collect the attenuated substance of that halo, to

* Quarry for April.

† 'The Romance of the Fungus World: An Account of Fungus Life in its numerous guises, both real and legendary,' by R. T. Rolfe, F.I.C., and F. W. Rolfe, with Foreword by J. Ramsbottom, O.B.E., M.A., F.L.S. London: Chapman and Hall, Ltd., 1925, pp. i.-xx., 1-309 Price 12/6 net.

condense it, analyse it, and to give us the results of their analyses in the form of a delightful book. The title is inviting, and is calculated to disarm the prejudice of the general reader not yet introduced to the fascinating subject of toadstools and their ways, and the contents will open up to him a new and interesting world. On the other hand the naturalist who already has a nodding acquaintance with the evanescent denizens of the woods and fields will find the book a useful guide to the bye-ways into which their study may lead, and which may be pursued with pleasure to himself and profit to



Photo by A. E. Peck,]

Earth-stars (*Geaster fimbriatus*).

[Scarborough.

science. The subject matter is sub-divided into fifteen chapters dealing with the fungi in mythology, in fiction and in reality, in medicine, commerce and industry. The work is enhanced by eighty-five illustrations, many of which are reproduced from the excellent photographs of Mr. A. E. Peck, whose camera studies among the fungi are well known. One of these we are permitted to reproduce. Mr. J. Ramsbottom contributes a Foreword, written with characteristic terseness, and all lovers and students of the fungi will join him in the hope for results therein expressed. The publishers are to be congratulated on their part of the work, and on the price at which the book is published.—F. A. MASON.

SEALS IN THE WASH.

Under the heading of 'Machine Guns Wanted,' we learn

from *The Yorkshire Post*, of April 17th, that, 'At the annual meeting of the Eastern Sea Fisheries Board at Spalding yesterday, Mr. H. Donnison, of Boston, the Fisheries Inspector, said that seals in the Wash were so numerous that they were one of the main causes of the scarcity of fish. One hundred and fifty seals were killed in the Wash during the year by sportsmen and fishermen. A dozen were also shot near Blakeney Harbour. The reduction, however, was not noticeable, for 146 seals were recently counted from the deck of the "Protector" on the Roger sand, and a few days later, some fishermen reported having seen over 200, the extra number being caused by the presence of a shoal of sprats. On the Dog's Head sand, there were two herd of seals, one facing the other on the side of an islet, and each herd was about half a mile in length. The question of the destruction of the seals had engaged the attention of the Board for twelve years, but the position still remained the same. Meanwhile, the seals had increased in number, notwithstanding those killed by sportsmen, and fish are scarcer, as also are the earnings of the fishermen.'

FLAMBOROUGH CLIFFS' BIRD LIFE.

We quote the following as printed in a Yorkshire paper recently:—'Seabird life on the cliffs at Flamborough is a fascinating study to the local student, particularly at the present time, when the migrating birds are returning to their old haunts. The chief point of interest, however, just now, is the appearance on the west of Flamborough Head Cliffs of *three fulmars*, an Arctic *specie*, which is related to the petrel. This is unusual, for the birds are very shy and not at all likely to rest at a spot that is constantly disturbed by egg pilferers. The fulmar is easily distinguishable in flight, as it gives four sharp flaps and then glides, the movement being swift and sure. When the sand martins arrive they will find their holes prepared for them by local bird students. *These visitors* esconce themselves in their abodes as soon as they arrive and are not seen for two days.'

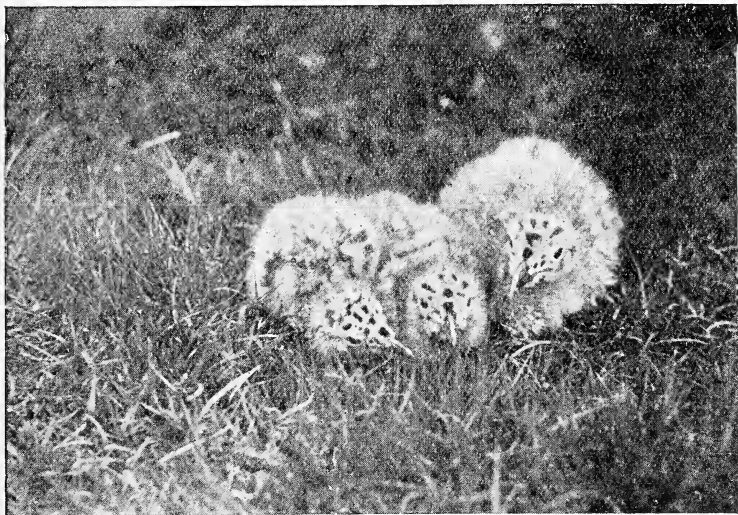
HARROGATE, SUGGESTED MUSEUM.

We learn from the press that Mr. T. Sheppard lectured before the members of the Harrogate Literary Club recently on 'Harrogate,' and in the course of his remarks said the number of Museums in relation to the population was some indication of the intelligence of that population. (For example Whitby, Scarborough, Darlington, Selby, Rotherham, Leeds, Doncaster, Huddersfield, each had one Museum; Sheffield, York, Halifax each had two, and Hull had six, whereas Harrogate had none). He could imagine nothing more of service to visitors to Harrogate than an artistic

building set apart where pictures, pottery and china, antique silver, Sheffield plate, furniture, statuary, etc., could be exhibited. He understood that at the moment there was a possibility of a suitable place known as Belvedere being available, and he would urge upon the members of the Town Council and others present the desirability of securing this, and furnishing it in the way indicated.

WATERSIDE CREATURES.*

Our contributor, Miss Frances Pitt, in this volume presents some more of her charming essays which have appeared in *Country Life*, *The Contemporary Review* and other journals.



Young Lesser Black-backed Gulls.

They are also interesting plates illustrating mammal and bird life. Miss Pitt's excellent work is so well-known that we feel all that is necessary is to draw attention to the fact that she has brought these essays together. One of the many illustrations we are kindly permitted to reproduce herewith.

BIRD PROTECTION BILL.

We learn from *The Times* that Sir Harry Brittain's bill to provide for the further protection of birds was considered recently by a Standing Committee of the House of Commons, Mr. Morgan Jones presiding. The object of the measure is to make it illegal for any person to use decoy birds which

* By Frances Pitt. London: G. Allen & Unwin, Ltd. 252 pp., 12/6 net.

are tethered or secured by means of braces or other similar appliances, or which are blind, maimed or injured, or to use bird lime or like substances for the purpose of capturing wild birds. It also makes it an offence to confine any bird in a cage or other receptacle of insufficient size to permit the bird freely to stretch its wings and exercise itself. An amendment proposed by Sir Harry Brittain, bringing Scotland within the scope of the bill, and leaving Northern Ireland out, was agreed to. The bill will operate as soon as passed. The Committee stage was concluded and the bill was ordered to be reported to the House as amended.

BEDDED IRON ORES.*

This volume deals with the microstructure and mineral composition of the English bedded iron ores, and contains a series of special analyses that have been made for the purpose of determining the minerals present in the oolites and ground-mass of the rocks. Chamosite, a chloritic mineral of simple composition, proves to be the main siliceous compound in the clay ironstones, which are chamosite and siderite mudstones. Detailed descriptions are given of the microstructure of the Cleveland and Northants Ironstones, the Marlstone, Carboniferous and minor bedded ores, which are classified according to their petrography. The plates include 42 photomicrographs of typical structures, and an account is given of the most recent work on the properties of the constituent minerals. Special attention is paid to the reactions that occur during weathering and their bearing on the question of secondary enrichment. The author discusses current theories of origin, and concludes that the ironstones are in nearly all cases primary deposits and are not replaced limestones. The price is exceedingly cheap, as indeed for such publications it should be.

—: o :—

White Wagtail, paired with Pied, nesting in Shropshire.—I have to record the nesting here of a White Wagtail. It is mated with a typical Pied Wagtail, and they have built a nest in the creepers on the house. Having watched and photographed White Wagtails abroad, I am quite positive as regards identification. I first 'spotted' the bird six weeks ago, but thought it was only passing through, but it has been about ever since, and has now paired with a Pied bird.—FRANCES PITT, 'The Allynes,' Bridgenorth.

* 'Special Reports on the Mineral Resources of Great Britain. Vol. XXIX.—Iron Ores: Bedded Ores of England and Wales. Petrography and Chemistry,' by A. F. Hallimond, with an Appendix by F. R. Ennos and R. Sutcliffe, 139 pp., 3/- net.

NOTES ON YORKSHIRE AMMONITES.

DR. L. F. SPATH.

III.—ON THE 'ARMATUS ZONE.'

It had for some time been suspected that *Ammonites armatus* was a fossil that was not confined to the zone that bore its name. Oppel¹ originally had been doubtful whether an *armatus*-bed ought to be separated at the base of the *jamesoni* zone, and the *Amm. armatus* he figured was sufficiently distinct from Sowerby's species for Oppel himself to suggest the name '*Amm. armatus compressus*.' Tate and Blake² separated what would now be considered to represent the *taylori*, *leckenbyi*, *tardecrescens* and *macdonnelli* horizons of Robin Hood's Bay, as an *armatus* subzone, from the *jamesoni* beds proper. In 1882, however, Wright,³ when describing '*Aegoceras armatum*', spoke of the *armatum* zone of Lyme Regis, a very different thing from the Yorkshire subzone, which was above and not below the *raricostatus* beds. Wright, moreover, stated that he had found fragments of this species [*Aegoceras armatum*] in the same zone in some exposures of the *Aegoceras jamesoni* beds near Cheltenham.

It was not till 1914 that Dr. W. D. Lang's⁴ careful collecting on the Dorset coast revealed the true position of *Deroceras armatum*, above the *Oxynoticeras*, but below the *Echioceras* beds. Sowerby's type, unfortunately, is not preserved in his collection in the British Museum, unless it be specimen No. C.17023, considerably smaller than the figure and sliced. From its representation as a pyritic cast (generally liable to decomposition) it has always seemed to me to be more like a Charmouth than a 'Whitby' specimen, and, at any rate, I have no doubt that the forms of Dr. Lang's bed 96 are identical with the type.

Now here is an obvious difficulty, for if *Amm. armatus* itself occurs only below the *raricostatus* zone, *i.e.*, well down in the Sinemurian, it would be absurd to retain an *armatus* zone in the Pliensbachian, however much we may protest that zonal names are only labels or that Deroceratids, including more or less similar forms of '*armati*,' persist throughout the *raricostatus* zone up into the lowest Pliensbachian.

¹ 'Mittl. Lias Schwäbens.' Württemb. Naturw. Jahresh., Vol. X. (1853), p. 72; 'Die Juraformation,' *ibid.*, Vol. XII. (1856), pp. 117 and 155. (Oppel could not find the *armatus* bed at Lyme, but his *Amm. armatus compressus* is undoubtedly a considerably later form than Sowerby's species).

² 'Yorkshire Lias,' 1876, pp. 78-81.

³ *Loc. cit.* (Pal. Soc. 1882), pp. 343-4.

⁴ *Loc. cit.* (Proc. Geol. Assoc., Vol. XXV., 1914), p. 321.

Meanwhile, however, Mr. Buckman¹ had established a Raasayan division for the Deroceratan and Echioceratan ages, with seven hemeræ. In a later paper² these were increased to thirteen sub-divisions, on very unconvincing evidence, and from remarks made previously³ on his classification of the beds in the *jamesoni* zone above and in the *oxynotus* zone below,⁴ and from the criticisms in the present paper of Mr. Buckman's correlation of the *armatus* and *varicostatus* zones, it will be seen that considerable modification of these surmised sequences is necessary. There will be no need, in the circumstances, to point out how useless is, e.g., the diagram of Mr. Buckman's Table X. (p. 95).

Going back, then, to the old sequence :

Lower Pliensbachian	<i>jamesoni</i> zone (Polymorphitan age).	
Upper Sinemurian	{	<i>varicostatus</i> zone (Deroceratan age).
		<i>oxynotus</i> zone (Oxynoticeratan age).
		<i>obtusius</i> zone (upper) (Asterooceratan age).

it will be seen at once that the terms Deroceratan or Oxynoticeratan ages were introduced without accurate knowledge of the ranges of the ammonites. *Gleviceras*, an Oxynoticeratid, which was believed by Mr. Buckman to characterise a horizon below that of *Oxynoticeratid lymense* (in the Oxynoticeratan age) is found throughout the lower *varicostatus* zone. In conjunction with the indiscriminate use of the names *densinodus* and *subplanicosta*, this gave rise to an unfortunate misrepresentation of Mr. Richardson's⁵ Bayliss Hill sequence, compared with which Blake's errors of fifty years ago were trifling. We are here back again at an arbitrary delimitation of divisions, dependant on individual interpretation, but whether we speak of the *armatus* hemera as part of the old *varicostatus* 'zone' or as part of the Deroceratan age may be considered to be of little consequence, although the latter is undoubtedly the better term. Since Oppel himself collected '*Amm. densinodus*' (probably *Cruciloboceras densinodulum*) at Lyme Regis, stating that Quenstedt's species occurred at about the boundary between the Lower and Middle Lias, but still in the *varicostatus* zone, it is clear that in spite of the abundant occurrence of *Gleviceras* and allied oxynotes with '*densinodus*' it must be included in the *varicostatus* 'zone.'

¹ 'Jurassic Chronology': I.—Lias.' *Quart. Journ. Geol. Soc.*, Vol. LXXIII. (1917), 1918, p. 276.

² *Ibid.* Supplement I., West England Strata, *ibid.*, Vol. LXXVI. (1920), p. 99.

³ L. F. Spath, *loc. cit.* (*Geol. Mag.*, 1923), p. 10.

⁴ 'Notes on Yorkshire Ammonites,' I.—The genus *Oxynoticeratid* Hyatt., *The Naturalist*, April, pp. 107-112.

⁵ In S. Buckman; *loc. cit.* (*Quart. Journ. Geol. Soc.*, Vol. LXXVI., 1920), pp. 69-70).

The sub-divisions of the Deroceratan age (*i.e.*, the ' *varicostatus* zone ') may then be listed as follows :—

	[Yorkshire]
<i>leckenbyi</i>	} <i>Apoderoceras</i> beds.
<i>exhæredatum</i>	
<i>tardecrescens</i>	<i>tardecrescens</i>
<i>macdonnelli</i>	<i>macdonnelli</i> .
?	? <i>obsoletum</i> .
<i>Echioceras</i> sp.n.	' <i>varicostatum</i> '
cf. <i>boreale</i>	} ' <i>varicostatoides</i> ' ^
cf. <i>rhodanicum</i>	
<i>ornatilibatum</i>	?
<i>armatum</i>	↓
<i>bispinigerum</i>	
<i>densinodulum</i>	

The ' *varicostatoides* beds,' no doubt, are capable of a more satisfactory division. The Yorkshire ' *Aegoceras* (?) *varicostatum*,' referred to by Blake¹ and the form figured by Wright² are sharply costate like the species of the *ornatilibatum* and cf. *rhodanicum* hemeræ. Similar crassicostate forms, however, and others more bluntly ribbed, still occur at Lyme (in the hemera of *Echioceras* sp. n., listed above) with large *Gleviceras*³ immediately below the ' Hummocky Limestone ' (*exhæredatum* hemera) and there is no room for the intervening *tardecrescens* and *macdonnelli* faunas. The horizons below, listed provisionally as cf. *boreale* and cf. *rhodanicum*, are now being worked out by Dr. Trueman and Miss Williams, and their results will be of great interest also to Yorkshire geologists. The writer hopes that someone will undertake zonal collecting in the corresponding beds of Robin Hood's Bay, and it is chiefly to facilitate correlation of the *Deroceras*-bearing beds of different areas and to rectify misleading nomenclature that the following notes are added.

We find, for instance, that the repeated occurrence of *densinodus*-like forms at different horizons has caused as much confusion as the repetition of the so-called *armatus*. *Crucilobiceras densinodulum*, at Charmouth, occurs already in the *lymensis* bed, but at the horizon of its maximum development it is associated with innumerable small forms which include

¹ In Tate and Blake, *loc. cit.* (1876), p. 276 (at least two different species—B.M., No. C19196-200 and C19195).

² *Loc. cit.* (1878), Pl. VII., figs. 2-5 (B.M., No. C.88980), poorly figured, in any case worn and, moreover, slightly deformed. Said to come from Lyme Regis.

³ Not very well preserved, like the earlier *Gleviceras* † (including ' *Glevumites* ' and ' *Victoriceras* '), but different types of young have been found loose.

immature *Crucilobicer*¹, but not one of which can be identified with the Gloucestershire *Microceras subplanicosta* (Oppel). *Deroceras bispinigerum*, which, with *Gleviceras*, occurs already in the *densinodulum* beds, attains its maximum development in the next higher horizon, and again is associated with *subplanicosta*-like forms. The adult '*bispinigerum*' from Dr. Lang's 'Small Nodule Bed' (95) at the base of the true *armatus* clays, has a subconcave periphery, and is quite unlike anything previously recorded.

Deroceras armatum itself is associated with *Gleviceras* and some undetermined compressed and smooth forms which are neither *Tubellites*² nor the keeled *Amm. jejunus* Dumortier,³ but may belong to the group of *Psiloceras abnorme* (Hauer) Geyer⁴ (= **Leptonotoceras**, gen. nov.), especially the compressed, smooth forms included by Geyer in *Psiloceras suessi* (Hauer), which may be renamed *L. leptonotum* nom. nov.⁵ The single minute ammonite nucleus found by Dr. Lang five feet above the 'Watch Ammonite Stone' (at the horizon of *Echioceras* cf. *boreale*), and recorded by Mr. Buckman as *Tubellites tubellus* (Simpson) Richardson sp., is probably not identical with the Yorkshire forms from the *macdonnelli* and higher beds, and as a zonal index *Tubellites* cannot yet be used with safety.

Mr. Buckman also quotes *Deroceras miles* from the *armatus* bed, but I would question that identification. Dr. Lang's Lyme example (B.M., No. C.22319) has the periphery, suture-line and twenty-two costæ of the true *Deroceras armatum* as figured by Sowerby,⁶ and it is associated with more inflated forms with only 16 ribs, for which the new name *D. obesum* sp. nov. (text fig. 2*h*, p. 139) is suggested. Reynès's⁷ examples are somewhat intermediate, perhaps also Wright's,⁸ but I have not examined his types in the Sedgwick Museum, and the figures are generally unreliable.

The *Crucilobicer* of the next higher horizon (*C. ornatilobatum*, sp. nov. = *Amm. densinodus* Reynès, pars,⁹ non

¹ Such as the Gloucestershire example, from which was taken the suture-line development represented in text-figs. 2*c-e*, p. 139. A Balingen (Wurtemberg) example, labelled by Dr. Wright *Amm. armatus densinodus* (No. 19), has more complex sutures at the same diameter.

² Based on *T. ('Bifericeras') tubellus* (Simpson) Richardson sp., *Trans. Woolhope Nat. Field Club* (1914-17), 1918, Pl. II., figs. 29-30.

³ *Loc. cit.* (Vol. II., 1867), p. 156, Pl. XXXI., figs. 6-8.

⁴ 'Cephalopoden Fauna des Hierlatz.' *Abhand. K. K. Geol. Reichsanst.*, Vol. XII., Pl. 4 (1886), p. 240, Pl. II., figs. 24*a, b*, genotype.

⁵ *Ibid.*, Pl. II., figs. 33*a, b* (holotype).

⁶ *Min. Conchol.*, Vol. I., 1817, Pl. XCV.

⁷ 'Monographie des Ammonites,' 1879, Pl. I., figs. 9-13.

⁸ *Loc. cit.* (1880), Pl. XXVIII., figs. 1-2 and 3-4 (and 5?).

⁹ *Loc. cit.* (1879), Pl. XXVII., fig. 18 only.

Quenstedt? with suture-line of text-fig. 2f, p. 139) have become more evolute and more ornatilobate than the similar 'densinodus' below, and are associated already with carinati-subsulcate *Echioceras* of a group not known to me from Yorkshire. This group probably also has been misinterpreted, like Blake's *Crucilobicerias obsoletum*, which is entirely different from the Lyme 'densinodus,' though crushed other forms more like the latter also occur in nodules. In this connexion it may be advisable to draw attention to another form, figured by Wright¹ as '*Aegoceras densinodum*,' which is not only specifically different, but belongs to a new genus (**Subcollina** gen. nov.²) which is interpreted as a development of the Upper Lias family *Dactylioceratidae*.

I can find nothing from Yorkshire that would indicate the presence of these pre-*varicostatooides* faunas; but since badly-preserved or crushed ammonites have not hitherto been taken much notice of, the help of local collectors is required. The horizon of Blake's *Crucilobicerias obsoletum* is as yet unknown. At Lyme the last *Crucilobicerias* occur just below the 'Hummocky Limestone,' but the upper *Echioceras* horizons are missing there. Conversely, *Crucilobicerias* of the type of *C. muticum* (d'Orbigny)³ and *C. nodoblongum* (Quenstedt)⁴ associated with *Derocheras* of the *miles* group have only been found in the *macdonnelli* beds of Yorkshire and the Midlands, e.g., Honeybourne, Worcestershire. This high *Crucilobicerias* has been mistaken for *D. armatum* even by Blake. From Emerson's and Hoyer's accounts it is evident that these *muticus* beds, in Germany, are of great thickness. The latter author⁵ recorded *Microcheras subplanicosta* (Oppel) from his *varicostatus* bed *e*, together with *Derocheras muticum*, and Mr. Richardson found it associated with the Honeybourne *Crucilobicerias* above mentioned. Of Blake's three examples of '*subplanicosta*,' none is identical with the Gloucestershire species, and they were, by him, considered to be the young of *Crucilobicerias obsoletum*. The Lyme *subplanicosta* have already been referred to, and if it is remembered that the Cheltenham succession is largely based on surmise, not actual

¹ *Loc. cit.* (1880), Pl. XXXVIII., figs. 5-6 (B.M., No. C.1932). Wright's drawing is restored, partly from the inner whorls shewn on the side not figured.

² The genotype, *S. yeovilensis*, nom. nov. (= *Aegoceras densinodum* Wright, pars, non Quenstedt, Pl. XXXVIII., figs. 5-6) in the peripheral aspect of the inner whorls resembles *Collina mucronata* (d'Orbigny), but its suture-line is characterised by a narrow, cruciform, lateral lobe almost as in *Crucilobicerias densinodulum*.

³ Pal. Franç., Terr. Jurass., 1842, Pl. LXXX.

⁴ *Loc. cit.* (1884), Pl. XXVII., fig. 6 only (figs. 3-4 = *Amm. armatus compressus* of Oppel).

⁵ *Loc. cit.* (1902), p. 42.

observation, it will be seen that the correlation of the 'sub-planicosta' beds, below the *bispinigerum* horizon, is altogether improbable. The coarse *Crucilobicerias cheltiense* and other forms above referred to which are not found at Lyme may well come from the *Leptechioceras* beds.

Since the *Apoderoceras* and *Epideroceras* of the uppermost Sinemurian (*leckenbyi* and *exhaeredatum* hemeræ) and the lowest Pliensbachian (*taylori* hemera) also have never been collected from zonally, a splendid opportunity is offered to some Yorkshire geologist.

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Social Life Among the Insects, by W. M. Wheeler. London: Constable & Co., Ltd., vii.+375 pp., 16/- net. Those interested in nature study or desirous of obtaining curious facts for popular lectures will find a wealth of information in this volume. It is largely confined to descriptions of the Social Beetle, wasps, bees and ants, and ant's guests. The illustrations are numerous, and many of them quite new to English readers.

Sporting Days in Wild Norway, by Dr. Fridtjof Nansen. London: Thornton Butterworth, Ltd., 270 pp., 10/6 net. Here we have a description of Norwegian life from an enthusiastic sportsman whose previous contributions to science in connection with his researches in the Arctic are of world-wide reputation. Dr. Nansen gives an account of the mountainous section of Norway, with its geographical features, fauna, etc., and, as we might expect, writes a particularly fascinating story.

Rainfall Reservoirs and Water Supply, by Sir Alexander R. Binnie. London: Constable and Co., Ltd., xi.+157 pp., 9/- net. Sir Alexander Binnie is a recognised authority on this subject, and the fact that a second impression of his volume has been called for is an indication of its popularity. Much of the work is occupied by descriptions of machinery, buildings, etc., in connection with water supply, but he deals with almost every aspect from the construction of reservoirs to the mechanism of water taps.

Bird Islands of Peru, by R. C. Murphy. London: C. P. Putnam's Sons, xx.+362 pp., 15/- net. To Europeans this volume will particularly appeal on account of the extraordinary variety of bird life depicted, and the quaint descriptions given of the avian occupants of the Chincha Islands. The frontispiece shows a group of curious step-like nests covering the whole side of a hill, with a seething mass of pelican chicks in the foreground, and there are descriptions of petrels, boobies, cormorants, gulls, terns, etc. The book, however, is not confined to birds; there are descriptions of mammals, reptiles and antiquities, and an interesting account of the history of the place generally.

Handbook of the Geology of Ireland, by G. A. J. Cole and T. Hallissy. London: T. Murby & Co., viii.+82 pp., 8/6 net. It will be remembered that during the War the Germans succeeded in publishing a Handbook of Regional Geology, which contained some of the most valuable publications to British Geology that we remember to have seen for some time. One of these, by the late Professor Grenville Cole and Mr. T. Hallissy, dealt with the Geology of Ireland, and the copyright has been purchased from the German publishers, and the volume has been issued separately. Geologists will welcome the publication in this form, especially in view of the difficulty in obtaining the German publication.

MODERN METHODS OF STUDYING THE SMALLER DIPTERA.

GEORGE GRACE, B.SC.

It will be remembered that Mr. Grimshaw, in his Presidential Address at Sheffield, last December (see *The Naturalist*, Jan., 1925), refers to the almost entire neglect of two winged flies (Diptera) by the naturalists of Yorkshire, although 'their study is not only full of fascination for the naturalist, but also of considerable importance from the point of view of the welfare of mankind.'

Later in his address, he suggests that one of the chief reasons for this neglect is the absence of literature suitable for beginners. Of this dearth of elementary literature there can be no doubt; the literature about Diptera which exists at present is scattered in many places and several languages, and, even when found, is generally so technical that it is hardly of any use to a beginner; and until this is remedied it is difficult to see how the study of Diptera can become more popular.

During the last two or three years I have given most of my spare time to the study of nematocerous flies, especially Chironomids, and, in the course of this, have collected a certain amount of practical information which, if I could have had it at the beginning, would have saved me many hours of futile labour.

I have therefore prepared the following account of my methods in the hope that it may act as an introduction to a most fascinating field of study.

Fortunately the collection of flies is a simple matter. They abound everywhere, and many of them may be obtained all the year round. The methods of capture I have found most useful may be summarised under three heads.

(1) By far the best way of getting uninjured specimens of most of the smaller flies is by picking them off from the lee sides of damp fences and walls and from the under sides of leaves by placing over them small glass tubes—a convenient size being about $1\frac{3}{4} \times \frac{3}{8}$. By this method, after a little practice, there is hardly any risk of breaking the legs of even the most frail, and a surprising number and variety may be taken this way. It is advisable, as a rule, not to attempt to take more than one or two flies in each tube, and to leave them alive in the tube until home is reached.

(2) A second method is by means of a small net about 6" diam., made of very soft material. Unfortunately there is always considerable danger in using any kind of net, that the frailer flies may have their legs damaged during the removal

to small tubes. This can be got over, to a certain extent, by using larger tubes, but I have never entirely eliminated it in dealing with Chironomids, which are extremely fragile. Sweeping low growing foliage with the same net gives many valuable captures, and so does beating hedges, etc., with a stick, and netting the flies which are disturbed.

(3) Much valuable work may be done by collecting larvæ and rearing them under as near natural conditions as can be arranged. The great variety of places where dipterous larvæ are to be found makes it impossible, in a general article such as this, to give even the vaguest hints about collecting. But the number of common flies about the development of which we know hardly anything, is so large, that anyone who will concentrate on one or two species which he happens to find convenient may easily do very important work.

For killing the flies I use a large jar with potassium cyanide in the bottom covered with a few layers of blotting paper. Into this I can put 20 or 30 small tubes at once, without removing the corks. This, of course, means that they must be left in the cyanide longer than if the tubes were open, but it keeps every fly separate, which is a great advantage.

Pinning should be done as soon as possible after death, as the flies dry quickly and become very brittle. For pinning, Mr. F. W. Edwards, of the British Museum, advises the use of No. 20 pins. He cuts off the heads of the pins diagonally with a pair of scissors and pushes the point into the side of the fly, but not so far as to go through to the other side. This is important, as the details of the sides are sometimes necessary for identification. He then inserts the cut end of the pin into a slip of celluloid which, in turn, is staged on a stout pin. Mr. Grimshaw recommends cork strips covered with paper instead of celluloid, and I have found polyporus useful, but when material is abundant and is not going to be subjected to rough usage, I hardly think any kind of staging is necessary.

With the very small flies, such as Chironomids, I have had hardly any trouble with mites, and I do not, therefore, use any disinfectant, but with larger flies I have no doubt some method must be used for keeping away mites, etc., as with butterflies and beetles. Even the smallest flies, however, occasionally go mouldy, and it is advisable to make certain they are dry before they are closed up in the store boxes.

For the storing of the flies I very much prefer small boxes, such as old quarter plate negative boxes with cork placed in the bottom. Each of these only contains 4 or 5 species, and need only be opened when these are to be referred to. When larger boxes are used they are opened so frequently that the

flies are very liable to lose their legs and antennæ. These boxes I label on the front edges, using coloured labels to distinguish the different groups, and store them edgewise, on shelves, like books in a bookcase.

The preservation of the larvæ without distortion is by no means a simple matter, and anyone who proposes to do this kind of work would do well to consult a paper on 'The Microscopic Preparation of Insects,' by Miss Huie, in *The Scottish Naturalist*, September, 1917. The following simple method, however, may be of assistance as a beginning. The larva selected for preservation should be kept without food for a day or two, and then killed by placing it on a piece of blotting paper, alongside a piece of cotton wool soaked in chloroform, under a tumbler. It is then placed in 70% alcohol for 24 hours, and afterwards removed to successively stronger mixtures of alcohol every 12 hours, until practically undiluted alcohol is reached.

If the larva is only required for the examination of the external features, it can be placed direct into potash solutions and treated by the methods described later.

When larvæ are reared through to the fly stage, it is important to bear in mind that newly hatched flies are very soft and, if killed at once, never make satisfactory specimens. It is advisable, therefore, to keep them for at least 24 hours, so that they may acquire a firmer texture.

The systematic study of the pinned fly, unfortunately, needs the use of a microscope, and this is probably another reason for the neglect lamented by Mr. Grimshaw. A very expensive instrument, however, is neither necessary nor, as a rule, advisable, and the technique needed for even quite detailed work is simple enough to be learnt in a few weeks.

For most of the work a low power such as a 1-in. objective is quite sufficient. With this the flies can be examined by reflected light without removing them from the pin. For holding the pinned fly and turning it about so as to see it from various points of view, some special holder is very necessary. This can be constructed with pieces of cork and a couple of pins, and, if mounted on an ordinary 3" × 1" glass slip, can be held in position on the stage of the microscope like an ordinary slide.

Modern methods of determining the species of most families of flies require that certain parts of the insects must be properly prepared and mounted for examination under a higher power, usually $\frac{1}{4}$ " or $\frac{1}{6}$ ". Although this requires a considerable expenditure of time, it is very fascinating work, and I have found it both useful and interesting to prepare a permanent set of slides illustrating the details of each species studied. Unfortunately there does not seem to be

any book or paper which gives the information required by a beginner in order to prepare these slides, and, remembering my own initial difficulties, I think it may be useful to describe the operations in what, to advanced workers, may appear to be unnecessary detail.

The parts of a fly which need mounting most frequently are :—(1) The antennæ, (2) The wing, (3) The legs, (4) The head and palps, (5) The hypopygium.

The antennæ of nematocerous flies are often used for systematic work, and the requisite details can hardly ever be obtained until they are suitably mounted. After the fly has been pinned for a day or two the antennæ become quite dry and brittle and can be easily removed by means of a moist needle, leaving the scape adhering to the head. On account of the frail nature of the usual antenna, the best mounting medium is Euparal. The refractive index of this is much lower than of Canada Balsam, and it does not obscure the details so much. The dry antenna on the tip of the needle may therefore be plunged into a drop of Euparal essence on a glass slip and allowed to soak for a short time. This expands it again to its original shape, removes any moisture, and makes it sufficiently transparent for even the higher powers.

A little Euparal is then placed on it and the cover slip dropped on, or, better still, a little Euparal is mixed with the essence in the first place, and this prevents complete evaporation and cements the antenna to the slip so that it is not displaced when the cover is placed on.

THE WING.—Most of the information generally required from the wing may be obtained without removal from the fly, but it is useful to have a set of typical wings for reference, and, in any case, as wings are spoiled when the fly is boiled in potash, it is best to remove them before the preparation of the thorax. Here, again, I think the best medium is Euparal, if a medium is to be used at all, but many wings are most usefully mounted dry.

When Euparal is used they may be dealt with in the same way as the antennæ, and may, in fact, be mounted under the same cover slip.

The method of making a dry mount is as follows :—The wing is removed by gripping it near its base with a fine pair of forceps and giving it a quick jerk. It is then immersed in Euparal essence on a slide. This is done in order to remove any dirt which may be adhering to it, and to arrange it on the slide. If the wing is very dirty it is best, after it has soaked for a minute or so, to move it about in the essence, and afterwards transfer it to a new supply. Then a cover slip is lowered on to it and fastened by means of small pieces of gummed paper, and the preparation is put aside until next day. It

will then be found that the essence has evaporated entirely and left the wing dry and apparently unchanged by its immersion. Dry mounted wings often show details which are invisible, or very difficult to see, in any fluid medium.

The other parts of a fly, before they can be mounted successfully, need to be cleared and rendered more or less transparent. The best solvent for doing this is a 10% solution of potassium hydrate. As this does not attack the pin, it is best, after the removal of the antennæ and wings, to drop the remainder of the fly, and the pin, into a test-tube containing a little potash solution. If an attempt to remove the pin be made while the fly is dry, it will probably come in pieces. The test-tube is placed in some kind of water bath—a metal box such as is sometimes purchased with shaving soap does very well for this—and the water raised to boiling for five minutes or longer as found necessary. By this method the inner parts of the fly are dissolved away and the chitinous shell expanded to its original shape. The fly is then removed to a vessel containing water, to partially clear it of potash, and then to glacial acetic acid to entirely neutralise any remaining potash and dehydrate. Further treatment will depend on the appearance at this stage. Large specimens with fairly dark colouring are best cleared in carbo-xylol, the frailer ones, which will not show clearly unless stained, are placed in an acid solution of Fuchsin and left for an hour or two until they are considerably overstained. They are then washed with acetic acid, which removes much of the stain, and cleared in oil of cloves. (Carbo-xylol is not suitable, as it removes the colour entirely.) From the clearing solution the specimen, whether stained or not, is removed to turpentine, where it can be dissected so as to get the parts separate. It does not seem possible to mount the whole fly so as to display all the detail needed. I have found it most useful to make three separate mounts of the legs, head and hypopygium. The mounting of the legs is simple and needs no further description, but the head and hypopygium need rather more elaborate treatment. If they are mounted in the ordinary way, the weight of the coverslip will crush them and distort their parts. It is therefore essential to use some kind of support under the coverslip. I usually place the head or hypopygium in a drop of fairly stiff Canada Balsam, on a slide, and arrange in the proper position with the help of a lens. Then I place the slide, etc., aside for one or two hours so that the balsam shall partially harden and act as a cement. When I think the balsam is hard enough to prevent displacement of the specimen, I arrange a few pieces of thin card or celluloid around it, drop on more balsam and cover as usual. This method makes it impossible for all the mount to be in

focus at once under a $\frac{1}{4}$ -in. objective, but unless something of the sort is done the dorsal point and the part immediately beneath it are so distorted that a very wrong impression of its shape is obtained. Slides so prepared are probably not so permanent as by the usual method of making a cell, but if a liberal supply of balsam is provided to allow for contraction due to evaporation, they should last long enough for all practical purposes.

Mr. Edwards recommends that hypopygia be mounted on small pieces of celluloid without cover clips, and that these should be pinned and kept in the storeboxes along with the flies.



Engineering Geology, by **H. Ries** and **T. L. Watson**. London : Chapman and Hall, Ltd., vii.+708 pp., 25/- net. This magnificent volume has now reached its third edition. We gave a favourable comment upon it when it first appeared, and the opinions then expressed have been justified by the constant demand for the work. All through, the needs of the practical engineer are kept in view, and there is not too much said about Palæontology, etc., though quite enough for engineering purposes.

A companion volume, printed and bound uniformly with the preceding, also once more makes its appearance (**Introductory Geology**, by **L. V. Pirsson** and **Charles Schuchert**. London : Chapman & Hall, x. + 693 pp., 20/- net). The first part was noticed in this journal some time ago. The present volume contains two sections, Part. I., dealing with Physical Geology, by L. V. Pirsson, and Part II., Outlines of Historical Geology, by Charles Schuchert. As with the book just noticed, the wealth of illustration is particularly noticeable, and the type and paper all that can be desired.

Nature at the Desert's Edge, by **R. W. G. Hingston**. London : H. F. and G. Witherby, 299 pp., 15/- net. The author of this volume spent a summer on an oasis near Bagdad, and gives the results of his observations on the animal life, and, in addition to the birds, he has much to say of the moths, spiders and various forms of insect life. Among the headings to the chapters (which give an idea of their character) are The Tent-building Spider ; The Oleander Hawk Moth ; The Mesopotamian Lappet Moth ; The Solifugid—Life History and Habits, and the author concludes by his 'general impressions of the desert,' which are very entertaining. There are several plates giving reproductions of excellent photographs : that of Bagdad from the air is particularly instructive, and gives a very different impression of that place from that usually held.

The Story of a Great Schoolmaster, by **H. G. Wells**. London : Chatto and Windus. 151 pp., 4s. 6d. net. In this volume Mr. Wells gives a 'Plain Account of the Life and Ideas of Sanderson of Oundle.' The reason for the book is given in the author's opening words : 'Of all the men I have met—and I have now had a fairly long and active life and have met a very great variety of interesting people—one only has stirred me to a biographical effort. This one exception is F. W. Sanderson, for many years the headmaster of Oundle School. I think him beyond question the greatest man I have ever known with any degree of intimacy, and it is in the hope of conveying to others something of my sense not merely of his importance, but of his peculiar genius and the rich humanity of his character, that I am setting out to write this book.'

THE COURTING HABITS OF THE HERON.

EDMUND SELOUS.

THE following extracts are taken from an observational diary I kept in a heronry during 1916. *Ecce signum.*

FEB. 17TH.—There was one particular bird, this afternoon, which distinguished itself from the rest by uttering, at intervals, a single harsh dissonant cry or scream. The frequency, not the cry itself, was the distinguishing feature. Such persistence and regularity suggest some special cause.

FEB. 18TH.—A bird standing alone in a nest bends its head down almost into it, and utters a low, clear, liquid note—‘koop’ or ‘hoop.’ It does this twice, and then flies off, with outstretched neck. I believe it is this bird which has been so persistently screaming, both last night and from the time of my arrival, this morning, at about 6.

FEB. 19TH.—From the same part of the plantation, as I enter it, at a little before 5 p.m., comes the same reiterated cry, one single short dissonant scream. I also hear, again, the clear, subdued musical ‘koop.’

FEB. 21ST.—A bird that has long stood, silent and solitary, in a nest, now, several times in succession, rears itself perpendicularly up, its long neck stretched to the full, with the bill in one line with it, spearing at the sky. As it reaches its full height, thus elongated, the head and neck are thrown back, and then the bird makes a little stoop or bob down, and utters a note which I find myself unable to define. It then lowers the head, still keeping the neck stretched out, clicks the bill, ‘koops,’ and pulls about the sticks of the nest. Then stretching up again, it repeats the whole performance, after which it stands and screams at irregular intervals. At last, as in answer to these cries, another Heron flies into the tree, alighting on a branch above, and some little way to one side of the nest. So far as I am able to discern, no form of greeting takes place between the two, but the ‘home-bird’—as, for the sake of distinction I will call the apparent owner of the nest—seems quietly pleased at the other’s arrival. After a little the visitant, whose demeanour has been quite unimpassioned, flies off, and is shortly followed by the home-bird. The latter soon returns, and continues to posture and scream as before. After a while, either the same or another visiting bird flies into the tree. It makes no advances, but the weird actions of the home-bird continue, and have now the appearance of being directed towards it. The ‘cap’ would seem to be ‘set.’ This goes on for some quarter of an hour or twenty minutes, after which the visitant flies away, but still the screams and the movements continue. Then

again, a visitant, but hardly has *this* one alighted when the home-bird spears forward at it, with its bill, in what seems a hostile manner. It is from too great a distance for contact, but instantly on the motion being made, the newcomer flies off. A longish interval is filled up as before, and then another bird flies in. Its reception, again, is different; two bows, each one accompanied with a short vocalic note, suggest an invitation to the nest. If so, however, it is not responded to, and the home-bird, shortly afterwards, flies excitedly out of it, makes a circle, and returns, to stand in it, now, merely, without further demonstration. The other bird stays on where it was, and such is the disposition of things when, it being now 8-45 and very cold, I leave.

Now what has been the meaning of all this? To begin with, the nest is one that I have not seen in regular occupation before yesterday. A bird has, once or twice before, settled upon it for a very short time, but that was all. It has now, apparently, been completed (for it looks a little larger than before), and definitely entered upon by this bird, who, to judge by appearances, is signalling for a mate. Two (possibly three) applicants have come, this morning, attracted by its cries and actions—both very salient—which, together, would seem to represent the courting display. One has been favourably received, and the courtship, from that point, specially addressed to it, the other instantly rejected, such rejection being, as instantly, acquiesced in. But the ‘who’s who’? has not yet been made out.

FEB. 22ND.—From 6-30 to 8-26 on the morning of this date, the bird which I have called the home-bird, standing, all the while, in the nest, has gone through the very salient action described yesterday, with its vocal accompaniment, thirty-nine times, at intervals varying from less than half-a-minute to thirteen minutes. This last, however, and another of seven minutes, only occurred once, the usual intervals being from one to three minutes. There has been, however, a curious difference in the cry, for whilst this was, yesterday, what I have described, with fair justice, I think, as a scream, it has now changed into, more or less, the ordinary nuptial or conjugal note, showing that this and the courting-note—eventually, at least—are one and the same. But there has also, this morning, been that other note, which I have called the ‘koop’—a very distinctive one, soft and musical—something like the bubbling of water—and whilst the other seems, rather, of the nature of a general matrimonial advertisement, this latter, accompanied with the lowering motion of the head and neck, is of a more direct encouragement-giving kind. It has been used by this same bird, this morning, on some six or seven occasions. But, neither yesterday nor this morning,

has either of the visitants uttered either of these notes or gone through any of their appertaining special actions. Their part has been quite distinct, that of rival candidates merely, and this has been emphasised, to-day, by their having, on several occasions, flown at and put each other to flight.

FEB. 23.—*In situ*, again, a little before 6 a.m. Matters, since yesterday, have developed. For the first time, there are two birds together, at the nest, both standing on the rim of it. Now they bill a little, showing that they are male and female, and that *one*, therefore (in all likelihood, at any rate), is the home-bird. Then one flies off, but makes only just a circle out from the tree, before returning. Then, fronting one another, they bill again, for a moment or two, immediately after which pairing takes place. At 7-10 the birds again bill—that is to say, they just touch the points of their two beaks together, for a moment—and there is again pairing, after which *the male* flies off and settles in a fir-tree quite near me.

7-20.—Another visitant flies to the nest and is received in a quite friendly way by the bird upon it. I am expecting further nuptial developments, when the previously favoured suitor flies up from the fir-tree, and puts the intruder to flight. Then, as previously, these two front each other, bill a little, stretch up their necks at each other, stoop and raise their crests. Then, again, *the male* flies off. At 8-15 there is a visitant to the nest, and the home-bird—the female—that has all the while been on it, makes two bobs forward, towards him, of the head and neck, and utters the musical, encouragement-giving ‘koop.’ The chain of evidence, therefore, is as follows. It is the same nest as yesterday, and previously. Only one of the three (or perhaps four) birds whose actions in relation to one another, have been noted to-day, has uttered, so I believe, either the nuptial note proper or the rarer ‘koop,’ or gone through the special action belonging to either. It is therefore, I think, legitimate to assume from this, as well as from the general conduct of the two (perhaps three) visitants, that these latter are the rival candidates, and the other the ‘home-bird’ of my previous entries. And since the latter was one of the two pairing birds, of which the other functioned as the male, by physiological inference the home-bird, who has, throughout, carried on the courting display, both gestic and vocal, is the female.

Putting all my observations together, and extending the particular to the general, I can hardly doubt that I have had a complete object lesson of the way in which the female Heron takes, or rather draws, unto herself a mate. Just as with the Shag, as made out and recorded by me,* (except that

* *Wild Life*, May, 1915.

she sits, and is not vocal) she stands for hours together in the nest, and at short intervals, often from minute to minute, utters cries which, commencing with a short scream, pass, on some certain day, into the nuptial and conjugal note proper, or one more or less nearly resembling it, and which are accompanied, each time, by the strange display-action which I have described. At much longer intervals, she utters a totally different note—monosyllabic, clear and musical—which I have rendered by the word 'koop,' succeeded sometimes by clicking of the bill and accompanied by movements almost as remarkable. In response to these love-cries and actions, male Herons come to the tree (as do male Shags to the rock) one or other of which, by its mere presence, seemingly, without display, gestic or vocal, recommends itself to the signalling female, and gradually becomes her mate. I need not further recapitulate, but will point out that there have been indications that the female Heron may not, any more than the female Shag, restrict her favours to one suitor only, at least during the earlier part of these curious proceedings. It would rather seem that what begins with mere amativeness, passes, by dint of jealousy, habit and, no doubt, competitive signalling, into conjugality proper.

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CORRESPONDENCE.

'WALDHEIMIA' CRANIUM MÜLLER: A CORRECTION.

With reference to the note by Hans Schlesch in last month's *Naturalist* (p. 148), I wish to point out that the generic name of this species is *Macandrevia*. This genus was created by King in 1859 (*Proc. Dublin Univ. Zool. Bot. Assoc.*, Vol. I., p. 261) with the *Terebratula cranium* Müller as the genotype. It was separated by him on account of fundamental differences in the interior of the shell from his genus *Waldheimia* (genotype *flavescens* Lam.). These differences have been fully substantiated by several workers since King's time. *Waldheimia* (King, *Perm. Foss.* 1850, pp. 81, and 145, pl. 20, f. 10-12) has long since been relegated to synonymy on account of its prior use for Insecta. It was replaced by *Magellania* by Bayle in 1880. *Macandrevia* is an interesting genus containing six or seven species ranging from the Arctic to the Antarctic Region. Two of the species have a considerable range, viz., *M. cranium*, which has been dredged off both coasts of the North Atlantic as far north as Spitzbergen. Its occurrence off the North Coast of Asia and Japan is new to me, and, I am afraid, doubtful; *Dallina raphaelis* may have been mistaken for it. The second species of wide range is *M. diamantina* Dall., which is recorded from the Gulf of Panama, off Peru, and off Coats Land, Antarctica.—J. WILFRID JACKSON.

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Behind the Scenes at the Zoo, by Helen M. Sidebotham. London: Cassell & Co., Ltd., 183 pp., 5/- net. By the aid of thick paper this volume seems considerably more massive than might be assumed from the comparatively small number of pages. The author writes on the principal occupants of the Zoo, and apparently the book is intended for younger readers who will be pleased with her descriptions of the various animals and delighted with the photographs reproduced on the ten plates appearing in the volume.

SABDEN SHALE FOSSILS NEAR HOLYWELL, FLINTSHIRE.

J. WILFRID JACKSON, M.Sc., F.G.S.

IN 1923, in company with Mr. R. C. B. Jones, I found certain Sabden Shale fossils in a section on the Glyn Abbot Road, near Holywell. Among them were imperfect examples of *Homoceras diadema* (Beyr.). On a more recent visit with Mr. J. Walton, I obtained much better preserved specimens of the above species in association with typical examples of *Homoceras proteum* (Brown).

The section is situated on the north side of the Glyn Abbot Road, and consists chiefly of black shales and brownish mud-stones. The beds dip at a very low angle to the east and are some distance above the Cherts. This section is referred to by Messrs. Hind and Stobbs in their N. Wales paper of 1906,¹ with the statement that these are the highest beds of the Pendleside Series examined *in situ* by them in the district. These authors give a list of ten species which includes '*Glyphioceras* ' *diadema*. The present confirmation of the occurrence of *Homoceras diadema* is interesting; but the ascription of the beds to the 'Pendleside Series' cannot now be maintained.

I obtained the first examples of *H. diadema* at the entrance to an old adit in the dingle below the road and from lower beds than those seen in the road-section. They were associated with *Posidoniella laevis*, *Pterinopecten carbonarius*, and fragmentary plant-remains. The road-section above yielded the same two bivalves, together with *Posidonomya* cf. *corrugata*, and fragments of *Calamites* cf. *suckowi*.

On the later visit, somewhat higher beds a little to the east were examined, and found to contain an abundance of *H. diadema* and *H. proteum* in all stages of growth.

The associated occurrence of the above two goniatites is of interest from the fact that they are found together in the lowest zone exposed in the Sabden Shales at Roughlee, near Pendle, Lancs. (=upper H. of Bisat)²; also at Eastwood, Todmorden, Yorks.; at the Gannister quarry, Congleton Edge, Cheshire; and in the Edale Shales, Mam Tor, N. Derbyshire, where the relation of this zone to the higher R₁-zone is clearly seen, as at Roughlee. At Mam Tor the band is only about 20 feet below *Homoceratoides prereticulatum* Bisat, and the latter is followed in ascending order by the Roughlee zones of *Reticuloceras inconstans* (Phil.) and *R. reticulatum* (Phil.).

¹ 'The Carboniferous Succession below the Coal-measures in North Shropshire, Denbighshire, and Flintshire,' *Geol. Mag.*, 1906, p. 454.

² *Proc. Yorks. Geol. Soc.*, Vol. XX., Pt. I., 1924, p. 10.

The Mam Tor Sandstones complete the sequence here, but in the immediate neighbourhood these Sandstones are overlain by the Shale Grit, Grindslow Shales, and Lower Kinder Grit.¹

The importance of the North Derbyshire sequence has been recently emphasised, and attention has been called to the identity of the Edale Shales with the Todmorden and Sabden series. The equivalence of some part of the Holywell Shales with those at Sabden and elsewhere can now safely be established from the intimate association of the two goniatites *H. diadema* and *H. proteum* in the Glyn Abbot Road section.

The age of the Holywell Shales has given rise to much speculation in the past. As pointed out in a recent paper,² they have been regarded on the one hand as in part representing the Millstone Grit of S.W. Lancashire,³ and on the other hand as Lower Coal Measures,⁴ while Hind and Stobbs (*op. cit.*, 1906, pp. 451-4) assigned them, together with the Teilia-limestones, to the 'Pendleside Series.'

In the recent Liverpool Memoir⁵ a suggestion is thrown out that they are probably in part homotaxial with the Upper Millstone Grits of the Midlands. Quite recently Mr. H. C. Sargent has been paying attention to the question and has met with evidence of the presence of several Millstone Grit zones, but has so far failed to locate zone H. (= *Homoceras*), hence this note. His paper was read at a recent meeting of the Liverpool Geological Society.

The two bivalves mentioned in this note, viz., *P. laevis* and *Pt. carbonarius*, occur together immediately below the *Proteum-Diadema* band at Roughlee. The same little *Pterinopecten* is also common in the *Diadema*-beds at Swartha Wood, Silsden, Yorks. The type came from the 'Pendleside Series' of Bosley Minn, Cheshire,⁶ but at present we do not know its goniatite-associate there.

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The Seventy-sixth Volume of the Palæontographical Society has been issued, and contains four useful monographs, viz.: The Pliocene Mollusca, by F. W. Harmer; Gault Ammonites, by L. F. Spath; Palæozoic Asterozoa, by W. K. Spencer; and The Macrurous Crustacea, by H. Woods.

¹ J. W. Jackson, *The Naturalist*, 1923, pp. 337-8.

² *Id.* *Manch. Memoirs (Lit. and Phil. Soc.)*, Vol. LXIX., No. 6, Feb. 26th, 1925, p. 4.

³ G. H. Morton, 'Geology of Liverpool,' Ed. 3, 1897, pp. 6, 27, 30.

⁴ A. Strahan, 'Geol. of Neighbourhoods of Flint, Mold, and Ruthin.'—*Mem. Geol. Survey*, 1890, pp. 3, 62.

⁵ 'The Geology of Liverpool, etc.'—*Mem. Geol. Survey*, 1923, p. 25.

⁶ Hind, *Carb. Lamell. Pal. Soc.*, Vol. II., p. 128, pl. XXV., f. 14. (NOTE.—The legends of figs. 14 and 15 in this plate have been transposed: see specimens in Hind Collection in British Museum Nat. Hist.).

YORKSHIRE NATURALISTS AT EGTON BRIDGE.

W. H. PEARSALL, D.SC., F.L.S., AND F. A. MASON, F.R.M.S.

THE first meeting of the year (299th Excursion) was held at Egton Bridge during the week-end, May 9th to 11th. Following a long spell of unsettled weather there was a burst of sunshine on the first morning of the meeting which gave a promise of improved meteorological conditions that was amply fulfilled. The President (Prof. J. H. Priestley, B.Sc.), Messrs. Bernard Hobson, M.Sc., A. I. Burnley, Greevz Fysher and Mrs. Fysher were among those from a distance who were early on the scene. The response of members of the Cleveland, Whitby and Scarborough Natural History Societies was an encouraging feature of the meeting.

The early part of Saturday morning was spent in an inspection of the ornamental and rock gardens in the grounds of Egton Hall, by the courtesy of Mr. Kenneth Foster, J.P. These had been constructed on a bank sloping down to the Esk and were particularly interesting to naturalists, as they included not only many unusual cultivated plants, but many of the original inhabitants of the bank. A little ochraceous pool, in which the iron bacterium *Gallionella ferruginea* was active, betokened the naturalness of the site, and a Red Bank Vole, which scurried into its burrow beneath a tuft of saxifrage, had certainly not been introduced by the gardener. After the arrival of the trains from Stockton and Whitby, a start was made for Arncliffe Woods under the guidance of Mr. A. J. Frank. In the regrettable absence of Mr. J. J. Burton, Mr. Hobson acted as interpreter of the local geology. This combination, together with the President and Mr. Burnley as botanists, made possible a useful survey of the woods and river bank.

A visit was paid to the Fish Hatchery during this excursion. With location in Arncliffe Woods, the Esk Fishery Association, under the auspices of Mr. Kenneth Foster, has established a hatchery for trout with a view to restocking the Esk. The water bailiff, Mr. Rhay, was good enough to explain the routine of pisciculture. It was shown how the eggs, the produce of fish known for their suitability for acclimatization to Esk conditions, were placed in frames consisting of parallel rows of glass tubes arranged at such distance apart as would allow the fry, on hatching, to slip through into the water in which the frames were suspended. The culture tanks consist of shallow, rectangular cement vessels arranged in series, and at the time of the visit these contained 65,000 trout fry, a few weeks old. The fry are fed on finely-ground bullock's liver at definite intervals, and they will continue to be so fed through their cultural stages. Later the fry will be transferred to 'fry ponds' and to the yearling pond, out of doors, until, when they have grown to a length of about eight inches (in the course of two years), they will be ready for turning into the river. It is hoped that this provision for restocking the Esk, which in recent years has suffered from a disproportionate increase of Grayling, will prove successful.

The trout fry appear to be subject to attack by at least two diseases, a fungus disease due to *Saprolegnia ferax*, of which there were examples in the tanks, and another, referred to by Mr. Rhay as 'red gill,' of which no example was available for examination. The afternoon was devoted to an inspection of the area known as the Holey Intake, the origin of which still remains to be explained.

The following day was filled by an excursion under the leadership of Mr. R. J. Flintoff, who, judging by his reception at the various keepers' cottages, has become an integral part of the Goathland countryside, and it must be conceded that his sturdy frame and alpenstock fit the landscape admirably! On this day he had a duty to perform, and none can say that he neglected it. After visiting the small clump of uncommonly occurring

trees at Egton the party proceeded to the slag heaps at Grosmont, where many interesting plants were seen. Industrial progress has resulted in the discovery of uses to which the slag can be put, and the heaps are in course of slow removal for road making material and other purposes. A slag-wool plant has been installed, and samples of the produce were examined. A discussion with reference to the composition of slag-wool was raised, and it was suggested by some that the material is phosphatic. The raw material is, of course, blast furnace slag, and contains only traces of phosphates; it consists of silicates of alumina and the alkaline earths, and a sample of the 'wool' on partial analysis was found to contain 32.5 per cent. of SiO_2 . The old road to Egton Bridge was next followed in taking a circuitous route to Beck Hole, a journey on which some of the more interesting plants of the district were seen. Altogether this was an enjoyable excursion, and the best things in the way of plant life were observed on this day.

Monday's excursion to Randay Mere, under the leadership of Mr. Frankland, ended a very pleasant and successful week-end.

A General Meeting was held on Saturday evening, the President being in the chair. Eight affiliated Societies were represented, and seven new members were elected. Votes of thanks were unanimously accorded to Mr. A. I. Burnley (the local Secretary); to the leaders of the various excursions on whose kindly services the success of the meeting had so largely depended, and to the landowners who had courteously granted access to their estates.

GEOLOGY (B. Hobson, M.Sc.):—Saturday, May 9th. Crossing the River Esk to its left (north) bank, the party, under the guidance of Mr. A. S. Frank, walked westward towards Glaisdale. Just outside the west end of the village of Egton Bridge, by the roadside, is a quarry in which the well-known Cleveand dyke is exposed. The dyke extends, with interruptions, from Blea Hill Rigg, near Robin Hood's Bay, to Armathwaite, $9\frac{1}{2}$ miles south-east of Carlisle. At Egton Bridge, the dyke is about 20 paces broad, and it cuts through the Upper Liassic shales, which are baked, and porcellaneous at the contact. The dyke is an augite-andesite and weathers yellow, though fresh specimens are bluish grey. The walk was continued to Arncliffe Woods, and, crossing to the right bank of the river, the party climbed to the top of a precipitous cliff overlooking a deep gorge cut by the Esk at Glaisdale to evade a morainic obstruction. The 'Pits' near Holey Intake, on the ridge separating Glaisdale from Egton Grange Valley, were visited. It is not improbable that they may have been made to obtain iron ore, for, in a field close by, much iron slag has been exposed by removal of the turf. The party descended to the well-known single arch stone packhorse bridge called Beggar's Bridge, said originally to be of the fourteenth century, but rebuilt by Thomas Ferries, of Hull, whose initials, with date 1619, are carved on a top stone of the parapet (east side).

May 11th.—Leaving Egton Bridge by the Goathland road *via* Key Green and Struntry Carr, the road was followed to Randay Mere. On the way excellent views were obtained of Moss Swang, the glacial overflow channel of Lake Eskdale. This is a broad U-shaped valley at the southern end of which is Castle Hill, round the west side of which the water formed an oxbow. Further on, Randay Mere was visited. This has been converted into a reservoir for Whitby, by excavating, damming up one end and cementing the sides, but part of the original mere seems to remain outside the reservoir at the south end. The Randay Mere valley was another of Prof. Kendall's glacial lake channels.

FLOWERING PLANTS (A. I. Burnley and R. J. Flintoff):—The extensive Arncliffe Woods, in a narrow and steep-sided portion of the Esk Valley, had Oak as the dominant tree, but contained many others, including Scots Pine, Larch, Wych Elm, Birch and Ash. The most conspicuous plant of the ground vegetation was the Great Wood-rush,

other plants being the Hairy Wood Rush, Honeysuckle, Wood Sage, Bilberry and, near the stream, Bog Violet and Sweet Cicely.

Beggar's Bridge, Glaisdale, had a fine display of the Maiden-hair Spleenwort, and the Estuarine series seen on the way to the 'Holey Intake' had Foxgloves in abundance on them.

On and near the slag heaps at Grosmont were the following interesting plants:—*Claytonia perfoliata* (in flower), *Lepidium draba* (nearly in flower), *Coronilla varia* (leaves only), *Salvia verticillata* (leaves only), *Reseda lutea* (leaves only), *R. luteola* (leaves only), *Hypericum perforatum*, *H. pulchrum* and *Verbascum nigrum* (leaves only). By the river side the Meadow Saxifrage and *Carex pendula* were seen in bloom.

In a small valley leading down to Beckhole, Oak Fern, Beech Fern, Male Fern, Lady Fern, Common Polybody, Prickly Shield Fern, Herb Paris, Toothwort and Bird Cherry were noted.

Of the moorland plants the least common one was the Black Bog Rush, seen in that fine overflow channel of Lake Eskdale, namely, Moss Swang.

Elecampane, Lesser Periwinkle, and three trees, viz., *Tilia tomentosa* Moench., or *T. argentea* D.C.; *Fraxinus excelsior* L. var. *diversifolia* Ait., or *heterophylla* Vahl., and *Ulmus montana* var. *monstrosa*, growing near Egton Bridge Station, were also observed.

COLEOPTERA (G. B. Walsh, B.Sc.):—Vegetation was in so backward a state that both beating and sweeping were of little use, and most of the short time at our disposal was spent in sifting moss and dead leaves. Beetles were, however, by no means common, and many even common species were not seen. The following were the chief species found, the locality in every case, except the one noted, being Arncliffe Wood:—

<i>Cychrus rostratus</i> Linn.	<i>Corticaria pubescens</i> Gyll. (common
<i>Pterostichus nigrita</i> Fab.	by beating thatch), Egton Bridge.
<i>P. diligens</i> Sturm.	<i>Aphidecta obliterated</i> L.
<i>Helophorus viridicollis</i> Steph.	<i>Coccinella 10-punctata</i> L.
<i>Cercyon flavipes</i> Fab.	ab. 10-punctata Ganglb.
<i>Megasternum boletophagum</i> Marsh.	ab. 10-pustulata L.
<i>Aleochara lanuginosa</i> Grav.	ab. 8-punctata Müll.
<i>Tachinus rufipes</i> De G.	ab. 6-punctata L.
<i>Quedius nigriceps</i> Kr.	ab. superpunctata Gradl.
<i>Philonthus decorus</i> Gr.	ab. humeralis Schall.
<i>Othius punctulatus</i> Goetz.	ab. scribe Weise.
<i>O. melanocephalus</i> Gr.	<i>Calvia 14-guttata</i> L.
<i>Lathrobium fulvipenne</i> Gr.	<i>Aphodius punctatosulcatus</i> Sturm.
<i>L. brunnipes</i> Fab.	<i>A. rufipes</i> L.
<i>Stenus clavicornis</i> Scop.	<i>Dolopius marginatus</i> L.
<i>S. similis</i> Hbst.	<i>Phædon tumidulus</i> Germ.
<i>S. flavipes</i> Steph.	<i>Apteropeda orbiculata</i> Marsh.
<i>S. impressus</i> Germ.	<i>Otiorrhynchus singularis</i> L.
<i>Oxytelus tetracaratus</i> Block.	<i>Polydrosus cervinus</i> L.
<i>Olophrum fuscum</i> Gr.	<i>Strophosomus melanogrammus</i> Först.
<i>Phyllodrepa floralis</i> Payk.	<i>Barynotus moerens</i> Fab.
<i>Anthobium primulae</i> Steph.	<i>Coeliodes dryados</i> Gmel.
<i>Trichopteryx</i> sp., probably <i>inter-</i>	<i>Cidnorrhinus 4-maculatus</i> L.
<i>media</i> Gill.	<i>Ceuthorrhynchus pollinarius</i> Först.
<i>Epuræa melina</i> Fr.	<i>Orchestes fagi</i> L.
<i>Micrurula melanocephala</i> Marsh.	<i>Apion pallipes</i> Kirby. (common on
(common on wild cherry	Dog's Mercury).
bloom).	<i>Rhinosimus planirostris</i> F.
<i>Meligethes æneus</i> Fab.	<i>Anaspis rufilabris</i> Gyll.

HEMIPTERA.—A single specimen of *Elasmotherus interstinctus* L. was beaten, and numerous examples of *Anthocoris nemoralis* Fab., *A. nemorum* L., and *Tetraphleps vittata* Fieb.

MOLLUSCA (Greevz Fysher):—The impression gained in first en-

deavouring to observe Mollusca in Arncliffe Woods and other localities in the district near Egton was that both individuals and species were almost wholly absent, but by searching in the early morning many species of terrestrial slugs and snails were obtained, as given in the following list from examination by Mr. John W. Taylor, M.Sc.; the above remarks about scarcity do not apply to the slugs, which were abundant here, as in most other places.

<i>Arion ater.</i>	<i>Pyramidula rotundata.</i>
var. <i>atritentaculata.</i>	<i>Helix hortensis.</i>
var. <i>alba.</i>	var. <i>lutea</i> , 00000 and 12345.
<i>A. hortensis.</i>	<i>Helicigona arbustorum.</i>
<i>A. circumscriptus.</i>	<i>Xerophila caeperata.</i>
<i>A. minimus.</i>	<i>Zua lubrica.</i>
<i>Limax maximus.</i>	var. <i>lubricoides.</i>
<i>Agriolimax agrestis.</i>	<i>Carychium minimum.</i>
<i>A. lævis.</i>	<i>Limnæa peregra.</i>
<i>Hyalinia cellaria.</i>	var. <i>ovata.</i>
<i>H. alliaria.</i>	<i>Ancylus fluviatilis.</i>
<i>H. nitidula.</i>	<i>Pisidium amnicum.</i>
<i>H. crystallina.</i>	<i>P. subtruncatum.</i>
<i>H. radiatula.</i>	<i>P. pusillum.</i>
<i>Zonitoides excavatus.</i>	

In the case of the aquatic species, the circumstances were reversed. Specimens were numerous, but only six species were observed, although the dredge was worked both in the river and in ponds some miles from headquarters.

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The Transactions of the Yorkshire Dialect Society, Part XXVI., contains a scholarly account of 'The River Names of Yorkshire,' by E. V. Gordon and A. H. Smith; Mr. E. G. Bayford gives 'Bairnsle's Best, wi' a bit abaght t'others'; and W. J. Halliday 'A Glimpse of the West Riding Dialects in Shakespeare's Day.'

We are glad to receive *The Annual Report of the Gresham's School Natural History Society* for 1924, which contains a useful record of work accomplished in the different sections. We should like to congratulate Mr. J. B. Hope-Simpson, the Secretary, on the successful year's work, and Mr. J. C. Miller, the Treasurer, in having so much money in hand.

The Transactions of the British Mycological Society, issued in May, contain several important papers. Mr. T. Petch gives three contributions dealing with Entomogenous Fungi; S. Kawagoe described the Market Fungi of Japan; E. M. Wakefield writes on the Matlock Foray; H. H. Knight on Lichens of Matlock; A. L. Smith on Recent Work on Lichens; A. W. Exell on the Hymenium of three species of *Stereum*; and H. Cunningham on New Zealand species of *Secotium*. These and other notes indicate that the editors of these *Transactions* cater for all fungological and allied tastes.

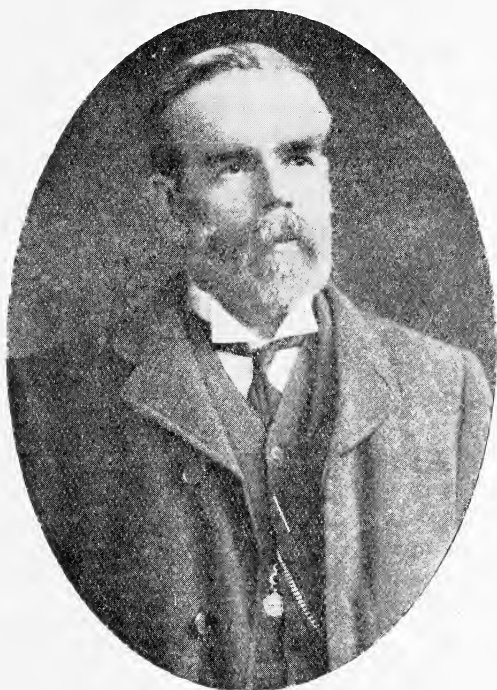
We have received the *Report of the Associated Learned Societies of Liverpool and District*, signed by W. Hewitt, Chairman, and Ethel Warhurst, Hon. Secretary. The Committee, as now constituted, consists of representatives of twenty-one societies, which have an approximate aggregate membership of nearly 4000. The objects of the Committee are to establish friendly relations and co-operative activities among these societies, to interest the local authorities and the general public in their objects, and so to increase the membership of the societies and their opportunities for useful work. The Report contains useful information respecting the various associated societies, and a monthly Calendar for 1925 showing the meetings of these societies during the year.

In Memoriam.

JOSEPH TAYLOR SEWELL, J.P.

(1857—1925.)

WE regret to record the death of our old and esteemed contributor, Mr. J. T. Sewell. For very many years he had looked after the interests of the Yorkshire Naturalists' Union in the Whitby area, and only a few days before he died he sent a



message to us in reference to the good work being done by certain naturalists at Whitby.

Whenever any body of naturalists, geologists or archæologists visited his area he was called upon to give advice and assistance. He was one of the very few taking a real interest in the museum at Whitby, and considerably helped the Curator there, his local knowledge, particularly of geology and antiquities, being very useful.

In 1905 he contributed an interesting note on 'Marine Erosion in the Whitby District' to *The Naturalist*; in the following year he wrote two papers dealing with glacial features in north-east Yorkshire to *The Proceedings of the Yorkshire Geological Society*, and other notes on similar sub-

jects appear in our journal, in the Reports of *The Whitby Literary and Philosophical Society* and elsewhere. He was born at Malton, was educated at the Ackworth and Bootham Schools, and went to Whitby about 1867, and started a successful business as a grocer.

There is no doubt that his early training at Ackworth School—which has produced so many well known naturalists, had much to do with his love for nature and art.

The writer has had the friendship of Mr. Sewell for very many years, and has been privileged to receive correspondence from him during that period. To Mrs. Sewell and the family we extend every sympathy.—T.S.

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BRADFORD SCIENTIFIC ASSOCIATION'S JUBILEE.

THE Bradford Scientific Association closed its winter session recently by an evening of a character unique in its history. This year the Scientific Association and the Bradford Natural History and Microscopical Society each celebrate their jubilee—an event which will be marked at the opening of the next autumn session by a joint conversazione. On April 3rd, however, the Scientific Association closed its lecture session by an evening devoted to brief addresses of reminiscence by past presidents and secretaries.

Dr. J. Hambley Rowe, this year's president, was in the chair.

Opening the proceedings, Mr. L. W. Bentley, the hon. secretary for several years past, read a long letter (which was published in full in *The Yorkshire Observer* for March 31st) from Mr. Alfred Crebbin, of California, U.S.A., who was one of the founders of the association fifty years ago, and reviewed much of its early history.

Messages of good wishes, together with tributes to the influence of the society for good in their own lives and work, were sent by Mr. J. E. Wilson, president in 1887-8 and 1894-5; Dr. Riley (now of Hull), a president who left Bradford thirty years ago; Miss M. A. Johnstone, the only lady president the association ever had; Mr. F. G. Skelton, a former secretary; Mr. H. E. Wroot (Leeds), president, 1905-6; and Mr. C. B. Holdsworth, secretary, 1895-1900.

Mr. Ezra Naylor, president 1888-9, 1895-6, 1900-01, now of Harrogate, spoke of the great work of many former stalwarts of the association, naming such well-known men as Messrs. Pawson (who had been both president and secretary), Colefax, Tate, Clough, Douglas, Alfred Walker, William West, Oliver, Hollway, Samuel Margerison, Crebbin Wilson, and others, and said the association had done much to direct his reading and influence his life. He congratulated the association on its progress, and complimented the present secretary (Mr. Bentley) on the remarkable syllabus of lectures just completed.

Other speakers were Messrs. C. Wood (president, 1892-93, 1899-1900), T. Pawson (1901-2), W. P. Winter (1902-3, 1913-14, 1918-19), E. E. Gregory (1897-8), F. Craven (1910-11), S. Bodland (1911-12, 1917-8), W. Newbould, R. Butterfield, and E. Gott, former secretaries; W. J. Forrest, J. N. Armitage, and Miss Richardson. Other past presidents present were H. Illingworth, H. C. Hunt, R. J. Steele, and T. Throup.

A full report of the proceedings appears in *The Yorkshire Observer* for April 4th.

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J. Delacour and M. Legendre write on 'The Shrikes,' and the latter has a paper on 'The Titmice,' in *The Avicultural Magazine* for May.

NEWS FROM THE MAGAZINES.

The Entomologist gives signs of improvement in the quality of its paper and papers.

C. E. Alford writes on the 'Effect of Weather on the Song Impulse,' in *British Birds* for May.

'Some Notes on Botanical Museums,' by H. H. Thomas, appear in *The Museums Journal* for May.

G. T. Lyle describes 'Some *Braconidæ* new to Britain' in *The Entomologist's Monthly Magazine* for May.

A. H. Willford refers to the effect of the hot sun on birds, and W. Rowan the effect of extreme cold on birds, in *British Birds* for April.

R. S. Bagnall, in *The Scottish Naturalist*, No. 152, describes '*Ophiodesmus albonanus* Latz., an addition to the Scottish Diploped Fauna.'

An appreciation of the late Sir Edward Thorpe, C.B., F.R.S., appears in *Nature*, No. 2888; and Prof. W. J. Sollas writes on the Cresswell 'horse' in No. 2890.

W. G. Sheldon writes on 'The Destruction of British Butterflies,' and W. J. Lucas on 'British Paraneuroptera (Odonata) in 1924,' in *The Entomologist* for May.

Man for May contains 'The Entry of the Bronze Users,' by Sir Flinders Petrie; 'The Purpose of Stonehenge,' by E. H. Stone; and 'The Solutrean Culture in Britain,' by M. C. Burkitt.

The Amateur Aquarist for spring, 1925, is enlarged. Among its varied contents are 'Adaptable Water Plants,' 'The Water Scorpion,' 'How to Breed Sticklebacks,' 'Desmids,' 'Grass Snake as a Pet,' and 'Planorbes.'

The Journal of the East Africa and Uganda Natural History Society contains two important papers, both by the Editor, Dr. V. G. L. van Someren. The first deals with Birds, and the second with the Butterflies, of Kenya and Uganda. (43 pp., 6/-.)

Among the contents of *The Journal of the Ministry of Agriculture* for May, we notice 'The Relative Palatability of Pasture Plants,' by W. Davies; 'Grassland Improvement in the West Riding,' by J. C. and D. A. Lynn; 'Rats,' by Prof. J. A. Thomson, and 'Aphides attacking Vegetables and Market Garden Crops,' by F. V. Theobald.

We learn from *Nature* that Mr. A. L. Armstrong recently read a paper to the Royal Anthropological Institute on 'Recent Excavations on Palæolithic Sites at Cresswell Crags, Derbyshire.' 'At the conclusion of the paper a letter was read from Sir William Boyd Dawkins, Chairman of the Committee, in which he entered a *caveat* against acceptance of the engravings on bone from Mother Grundy's Parlour as of human origin. In his opinion they were due to the action of roots.'!

The Annales Zoologici Musei Polonici Historiæ Naturalis contains a 'Revision of the Polish *Coraxidæ*' in English, by T. Jaczewski, and *Mitteilungen der Anthropologischen Gesellschaft in Wien* gives 'Notes on the Physical Anthropology of certain West African Tribes,' also in English, by L. W. G. Malcolm. In *El Salvador*, published in Zaragoza, Longinos Navás has a note, 'Una nueva fauna lacustre de España,' in which he reproduces Dr. F. A. Bather's notes and illustration which appeared in our journal (*El Naturalista*) recently.

The first part of *The Journal of Ecology* for 1925 contains several important papers. W. Watson refers to the Bryophytes and Lichens of Arctic-Alpine Vegetation; A. S. Watts writes on 'The Ecology of British Beechwoods'; Professor F. W. Oliver on '*Spartina townsendii*'; B. Lloyd on 'The Phyto-plankton of the Welsh Coast'; E. P. Farrow 'On the Ecology of the Vegetation of Breckland,' and H. F. Barnes on 'The Ecological Distribution of Adult Crane-flies in Carnarvonshire.' It has been found necessary to alter the price to 18/- each part of this journal.

NORTHERN NEWS.

The Huxley Medal of the Royal Anthropological Institute has been awarded to Sir William Ridgeway.

Mr. H. Crowther, of the Leeds Museum, has been elected President of the Conchological Society of Great Britain.

May 4th was the centenary of the death of T. H. Huxley, one of England's greatest exponents of scientific truth.

Messrs. T. Sheppard and T. W. Woodhead have been elected Honorary Life Members of the Leeds Co-operative Field Naturalists' Club.

Lloyd's 'Mycological Notes,' No. 69, contains a portrait of A. D. Cotton, and No. 72 of Elsie M. Wakefield, both well known to our readers.

'A Sketch of the Geology of the Whitehaven District,' by B. Smith, and others, appears in *The Proceedings of the Geologists' Association* for April.

Mr. Geo. B. Stanger, a well-known Leeds entomologist, has been awarded a pension by the Murdoch Trustees, Edinburgh. Mr. Stanger is 71, and unfortunately not in the best of health.

The Prince of Wales will be the President of the British Association for the Oxford Meeting in 1926. The last member of the Royal Family filling the office was the Prince Consort, in 1859.

In celebration of its Centenary, the Museum at Bergen has issued an admirable volume entitled 'Bergen's Museum 1925,' containing a summary of its hundred years' work, with portraits of those who have assisted it.

In *The Proceedings of the Zoological Society of London* for 1925, Pt. 1, Mr. G. C. Robson describes in detail, anatomically and otherwise, the squid washed up on the shore at Withernsea, which was figured in these pages for April.

Part LI. of Buckman's *Type Ammonites* contains no Yorkshire species. We observe that *Wheatleyites reductus* is now reduced to *Shotoverites pringlei* nov.; and *Ammonites deslongchampsii* in future is *Cadomites homalogaster* nov. Stepheoceratan, *Leptosphinctes*.

The Daily Chronicle recently contained an article on a 'Journey to the Centre of a Mountain,' explaining the 'explorer's perils.' The 'heart of the mountain' is now to be reached after a walk of 250 yards. Ingleborough seems to have shrunk since we were there last.

As from January 1st, 1925, the subscription price of *The Journal of Ecology* is raised to 25/- per annum, and the prices of single parts in proportion. This applies also to all back volumes and parts, except those which are sold at a reduced price because there is a surplus stock.

The British Museum (Natural History) has issued a Catalogue of the Type Specimens of Lepidoptera Rhopalocera in the British Museum (Part II.—Danaiidæ), by N. D. Riley and A. G. Gabriel (56 pp., 4/6). This will be valuable to students of this particular branch of Entomology.

At a recent lecture to the Royal Institute, Sir Arthur Keith stated that 'the evidence obtained from certain fossil remains at Galley Hill in 1888 points to an antiquity of man of no less than 100,000 years.' Yet other competent authorities state that the Galley Hill remains are comparatively modern.

Volume XXV., Part II. of *The History of the Berwickshire Naturalists' Club* contains an address by W. McConachie dealing with local mammals; J. Clark writes on 'The Bees, Wasps and Ants of Berwickshire'; J. B. Duncan lists the Mosses of Berwickshire and North Northumberland, etc. There are also geological, archaeological and meteorological notes.

Mr. Gerald Simpson has been giving an Address on Archaeological Work which has been printed in the March issue of the Durham University Journal. In this he states, 'At the outset I feel I am placed on the defensive by the knowledge that the parent of Scientific Societies, the British Association, has given no official recognition to Archaeology.' We think Mr. Simpson might do worse than consult any one of the Annual Reports of the British Association.

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PRINCIPALLY FOR THE NORTH OF ENGLAND.

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and T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
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JOHN W. TAYLOR, M.Sc.

RILEY FORTUNE, F.Z.S.

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NOTES AND COMMENTS.

THE LIFE OF THE BAT.*

The author here gives a lengthy account of the life history of the bat, and bases his observations largely on a captive bat to which he gave the name of Noctu. Quite apart from the scientific value of the volume, it will appeal to young readers for its human interest. The woodcut forming the



From a wood-block by]

Bats.

[E. Fitch Daglish.

frontispiece is excellent, and we are permitted to reproduce it.

WILD CATS.

We quote the following letter, signed 'Naturalist,' which appeared in *The Yorkshire Post* for April 9th, without comment :—' It is stated this morning that a fine wild cat, from Scotland, has been placed in the "Yorkshire Museum," but we are not told where this is, and lest any one should

* By Charles Derennes. London : Thornton Butterworth, Ltd., 153 pp., 6/- net.

waste time in a wild cat chase round the county, the information might be desirable. The present curator of the Yorkshire Philosophical Society's Museum at York, it is believed, has recently altered the name of the familiar "York Museum" to that of the "Yorkshire Museum," so possibly this is the institution in question. When the York Museum was founded, over a century ago, it was the only one in the county, and quite properly the founders desired that it should contain a representative collection of the antiquities, etc., of the county; but the example set by York was quickly followed at Sheffield, Hull, Scarborough, Whitby, and other places, at each of which museums were founded, and some of which now possess more representative collections of certain Yorkshire objects than does the museum at York. Seeing that all the most important places in the county now have their own museums, each paying particular attention to its own district, does it not seem desirable that the York Museum, as it has been called for generations, should be the correct name of the institution, which, after all, has a wonderful collection of York antiquities, and really is a York Museum. If by "Yorkshire Museum" it is intended to be inferred that its collections refer to the county, why accept a wild cat from Scotland?'

SOME FLINT TOOLS OF THE IRON AGE!

The Rev. H. G. O. Kendall describes what he correctly refers to as 'a singular series of roughly made flints,' the use of which seems very problematical, in *The Antiquaries' Journal* for April. 'These flints I have assigned to the Iron Age,' he says, referring to the 'type,' but we get no reason whatever. He then refers to 'Rectangular and allied tools, slightly bluish,' and 'Unaltered specimens of the "Rectangular" series, very numerous. . . . Re-chippings on patinated tools show the order of the several series.' We then learn 'From the foregoing, together with other evidence, it seemed to me that they "were not earlier than the Iron Age."' But it is *any*—never mind *other*—evidence we want. Perhaps the following is it?

A RIM FRAGMENT.

The Reverend gentleman goes on, 'Mr. and Mrs. Cunningham have been able to show, by their recent excavations, that Figsbury Ring . . . is of the Iron Age,' possibly because 'on the flat bottom of the wide inner ditch they found a pile of . . . tools and flakes of the "Rectangular" series.' 'In the same stratum with the flints,' writes Mrs. Cunningham, 'was a rim fragment of a wheel-turned rim bowl, of a type *probably* not much, if at all, earlier than the first century, A.D., the only piece of this type of vessel that was found at

Figsbury. Then, quite properly, we think, 'She refers to the possibility of any small single object having worked down below its normal level.' But Mr. Kendall, who did not dig it up, will have none of this. He adds, without a scrap of proof beyond his 'I have assigned,' that 'In any case the whole evidence obtained shows that the "Ring" is of the Iron Age.' Later in the same article we learn that 'Pot-boilers, both of this [Iron] and the Bronze Age [there are not many prehistorians who dare attempt to date pot-boilers] are numerous on the down. These are often connected with burnt areas. Fragments of Romano-British pottery are plentiful in one place. Mr. and Mrs. Cunnington found "pot-boiler" flints at Figsbury.' Yet they must be of the Iron Age! On just as much evidence these rectangular flints might, in other hands, have been described as Cave Period, Roman, or even Maglemose. The marvel is that the editor of our chief antiquarian paper will print such stuff.

ROTHERHAM NATURALISTS' SOCIETY.

The 45th annual meeting of this Society was held in the Museum, Clifton Park, Rotherham, recently, Mr. R. Chislett presiding. The Hon. Treasurer (Mr. J. Waite) gave his report, which was very satisfactory. The Hon. Secretary (Mr. R. Stewart) reviewed the work of the year. They had had a very satisfactory season, and good work had been done. Excursions were made to Conisbro' and Sprotbro', Cresswell Crag, Cordwell Valley, and Roche Abbey. The Sorby Scientific Society, Sheffield, joined them on the first excursion, and the Doncaster Scientific Society on the last. After each excursion an exhibition of the flora and pond life obtained was held in the Museum, the botanical specimens being displayed and named and the pond life shown by microscopes. They had again had an excellent course of winter lectures. Eight lectures were given in the Museum, as follows:—Rev. W. Dyer (President), on 'The advantages of the study of Natural History' Mr. E. Snelgrove, B.A., on 'Plant Communities'; Mr. A. Whittaker, on 'Bats: their Haunts and Habits'; Mr. E. W. Thirkell, on 'Old English Villages and Village Life'; Mr. A. A. Dallman, on 'Thrift: a Study of a Familiar Plant'; Mr. E. Brand, on 'Prehistoric Ages' (local); Mr. E. Kirke, on 'Butterflies and Moths'; Mr. R. Chislett, on 'Natural History of Öland.' Lecturettes had also been given by members. Microscopical and telescopic evenings were also held. Several members attended the annual meeting and lectures and conversazione of the Yorkshire Naturalists' Union, in Sheffield, in December last. Miss E. Tillotson had lent to the Society 150 volumes on natural history. The junior naturalists from the High School, Grammar School, and Central Schools have been invited to the

Society's exhibitions. Mr. G. Howard compiled the rainfall, temperature, etc. The records of the flora and fauna of the district included botany, birds, fishes, insects, geology, rainfall, etc. Seven new members were elected during the year. The Rev. Walter Dyer was again chosen as President.

DARLINGTON NATURALISTS' FIELD CLUB.

An outstanding year in its history was recorded at the annual meeting of the Darlington and Teesdale Naturalists' Field Club held recently, with the President (Mr. R. Luck) presiding. The Hon. Secretary (Mr. John E. Nowers), stated that the past year was a record one in the history of the club. The visits of the Yorkshire Naturalists' Union and the newly-formed Northern Naturalists' Union seemed to have, to a certain extent, infused new life into them, but there was much more practical scientific work and record-keeping to be done. It was hoped that this would be remedied in the near future when the sectional alterations suggested by the council were carried out. During the year specimens had been presented to the Museum, and a few purchased. Particularly worthy of mention were the collection made in the South Seas by the late Theodore West, and presented by Miss Shout, and a type collection of diptera captured during the visit of the Yorkshire Naturalists' Union last August by Mr. Percy H. Grimshaw, and presented by him. There had been several additions to the library, both by presentation and purchase. Twenty-seven new members had been elected. The total membership was now 158, against 138 last year. The Hon. Treasurer (Mr. R. H. Sargent) reported a balance in hand of £25 4s. The Librarian (Mr. James Broadhead) stated that there were now 366 books in their club's library. Mr. J. B. Ord was elected President for the ensuing year.

WATER MOVEMENTS IN THE ENGLISH CHANNEL.*

The report deals with the physical conditions, as evidenced by the salinity, of the surface waters of the English Channel during the years 1920-1923. During this period water was found which is not usually present, at least, in such quantity in this locality, and its salinity shows it to have had an oceanic origin. Since the supply of ocean water to the southern half of the North Sea is maintained from the English Channel, this finding has an interest from the point of view of the hydrographical conditions obtaining in the North Sea, and may be of assistance towards a more complete understanding of the reasons for the poverty of the herring fishery in the year 1921.

* 'Report on the Salinity and Water Movements in the English Channel, etc. (Fishery Investigations, Series II., Vol. VII., No. 7).'

BRITISH WHALES.

Sir Sidney Harmer has issued his Report on Cetacea with



the species Stranded on the British Coasts during 1923 and 1924. It includes an illustration of the lower jaw of an enormous Blue Whale (*Balaenoptera musculus*) which has been set up at South Bragar, by Mr. Murdo Morrison. 'It

gives a striking idea of the size of this enormous animal. The length measured by Mr. Morrison along the curve of the ventral surface was 85 feet, the width across the tail-flukes 20 ft. 3 ins. Each ramus of the lower jaw was 24 ft. 7 ins. along the outer curve. Before erecting the jaw, about 9 inches were sawn off the interior end of each ramus and about 5 inches were removed from the condylar end. Even with these removals the arch is 19 ft. 8 ins. high and the width across at the base is 14 ft. 3 ins.' In the map accompanying Sir Sidney's Report, which shows the various species stranded round the coast, there are only two records for the two years along the whole of the East Coast from Berwick to the Isle of Wight. One is a White-beaked Dolphin at Tynemouth, and the other is a Bottle-nosed Dolphin at Frinton, Essex.

OVER-CAUTIOUSNESS.

We take the following from Lloyd's *Mycological Notes*, No. 66: 'For many years after mycologists began to see the folly of calling everything "new species" that came into their hands and the new species game had been worked to its limit, then they began getting up excuses to call them new genera. We had a whole series of writers, beginning with Karsten and going through Quélet and then to Murrill and Banker in Cincinnati, who discovered every section was a new genus and got up a lot of combinations for the purpose, as I have always contended, of seeing their names in print. They have been ridiculed so much that they are beginning to give that up. A recent instance of enlarged conscientiousness on the part of Mr. Coker is quite amusing. *Stereum albobadium* was so named by Schweinitz as *Thelophora*. Léviellé discovered that some *Thelophoras* had hairs on the hymenium and called them all *Hymenochaete*, though not particular about the kind of hairs, and did not pay enough attention to it himself in several cases, so that he did not pick out the species of *Hymenochaete* among those he discovered were "new species." Cooke got up the idea that those that had hyaline, thick hairs which Cooke called *metuloids*, made another genus which he called *Peniophora*. It did not make any difference to Cooke whether they were resupinate or pileate, just so they had this kind of hairs, then they were *Peniophora*. Then Bresadola comes along and finds if they are resupinate they are *Peniophora* (or *Kneiffia* as he called them for a brief period), and if pileate they are *Lloydella*. No one among the allies has accepted this view, but some of the Germans, such as Höhnelt, have adopted it.'

MYCOLOGICAL NOMENCLATURE.

'*Stereum albobadium* was sent to Berkeley from around Cincinnati, and through pure carelessness apparently, was

called *Stereum albomarginatum*, Berkeley not intending to apply a new name to it, but did not take the trouble to look up Schweinitz's name. Massee discovered it had these metuloids and called it *Peniophora albomarginata*, simply copying it from Berkeley's label without the trouble of looking it up. Now Mr. Coker comes along and decides it should be a *Peniophora* on the authority of Mr. Massee, and uses the Massee name, although he knows it is the same plant that was originally named *Stereum albobadium* by Schweinitz. He states he does not use the Schweinitz name "because we do not want to make new combinations." Mr. Coker's enlarged conscientiousness, on this score, is quite amusing, but we strongly commend it to the attention of those we have mentioned before who not only do not want to avoid making new combinations, but seize on every possible excuse to do so. We do not know whether Mr. Coker's stand or the stand of our professional name-jugglers appeals to us as most absurd, but neither has much merit.'

A DERBYSHIRE SUCCESSION.

At the first Ordinary Meeting of the newly-formed Manchester Geological Association, held recently, the Hon. Secretary, Mr. J. Wilfrid Jackson, read a paper on 'The Succession below the Kinderscout Grit in North Derbyshire.' It contained the results of researches commenced before the war and continued at intervals during recent years. It gives a detailed account of the stratigraphical and palæontological succession of the beds between the Kinderscout Grit and the Carboniferous Limestone, and special attention is devoted to the Shales with Limestones which overlie the massifs. These Shales, now called the Edale Shales, have previously been referred to the Yoredale Series and to the Pendleside Group. Evidence is given to show that the shales are not related in any way to the strata just named, but are stratigraphically above them. The fossils are identical with those occurring in the Sabden Shales of Lancashire and their equivalents elsewhere, and the same succession of goniatite-zones is present. The correct determination of the fauna of the Edale Shales has had an important bearing upon the question of the age of certain beds ascribed to Kinderscout Grit in Lancashire and Yorkshire. The evidence derived from the type area of the Kinderscout Grit has rendered it necessary to discard the term Kinder Grit in the case of the grit overlying the Pendle Grit, and underlying the Sabden Shales. On the other hand it confirms the attribution of the name Kinder Grit to the grit overlying the shales in the Todmorden and Hebden Valleys.

THE BORROWDALES IN THE LAKE DISTRICT.

At a recent meeting of the Geologists' Association, Mr.

J. J. Hartley read a paper on 'The Succession and Structure of the Borrowdale Volcanic Series as developed in the area lying between the Lakes of Grasmere, Windermere and Coniston.' The main object of the paper is to trace the effect of the well-known Coniston and Windermere faults on the Borrowdale Volcanic Series. The effect of these faults on the outcrop of the Coniston Limestone Series is clear, but further north, in the volcanic rocks, they are more difficult to follow. A petrological succession for the volcanic rocks in this district is first established, and the tectonic structure, with the nature of the folding and faulting, is investigated. The general result of the work appears to show that the effect of the faulting on the Borrowdale Volcanic rocks has been to produce relative displacements of a vertical rather than of a horizontal nature, and that these rocks were folded along lines running nearly N.-S. before the deposition of the Coniston Limestone Series.

THE PERMIAN OF DURHAM.

At the same meeting Dr. C. T. Trechmann read a paper with the above title. 'The communication includes a map of the County of Durham and the S.E. corner of Northumberland, showing the Permian divided into its various beds, the Yellow Sands, the Lower Magnesian Limestone, the Middle Magnesian Limestone, including the Bryozoa reef and the bedded dolomites that lie to the east and west of it, and the Upper Magnesian Limestones comprising the Cannon Ball Limestone and the uppermost Hartlepool and Roker Series. There is also a section of the southern portion of the Durham coast; the northern half was sketched out by the late Dr. Woolacott some years ago. A description of the Faunal peculiarities of the Bryozoa reef is given and the gradual extinction of the mollusca and other animals that went to build it up is indicated. A comparison with the Permian of East Germany is instituted, and it is shown that the Durham Permian is more like that of Germany than it is that of the rest of England. A tabular list of Fossils, the result of some 20 years' collecting in the district, is supplied.'

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Osprey at Goathland, Yorks.—Mr. W. S. Medlicott wrote last Sunday (10th May) to tell me that an Osprey had appeared that day at Goathland, and spent an hour over and about his farm, chased by starlings. It is sad to think that we can no longer claim this splendid bird as a breeder within these islands. No doubt this was a migrant on his way from his winter quarters to his Scandinavian nesting grounds.—W. H. ST. QUINTIN.

NOTES ON YORKSHIRE AMMONITES.

DR. L. F. SPATH.

IV.—ON SOME SCHLOTHEIMIDÆ.

YORKSHIRE species of this family are feebly represented in the collection from the Hull Museum, sent to the writer, but they include the well-known ammonite '*Schlotheimia angulata*,' which since the publication of Bayle's magnificent Atlas in 1878¹ has so largely figured in geological literature. The lack of finality in palæontological nomenclature, that amateur geologists find so disconcerting, is well illustrated by the recent renaming of this oft-quoted ammonite.

Wright,² in 1879 and 1881, still left his example from Lyme Regis in the genus *Aegoceras* Waagen, and the species had previously been recorded in Tate and Blake's 'Yorkshire Lias'³ as *Aegoceras angulatum*. Zittel,⁴ however, in 1884 adopted Bayle's name and figured a form as '*Schlotheimia angulata*' (now renamed *Scamnoceras angulosum* Lange) which is generically different from Bayle's '*Schlotheimia angulata*' (now *S. princeps* S. Buckman⁵). Later authors followed Zittel in adopting *Schlotheimia*, for example, Steinmann and Döderlein,⁶ who, in 1889, reproduced Wright's example as a typical *S. angulata*. Pompeckj,⁷ in 1893, and Mr. Buckman,⁸ in 1906, accepted this as the true *Schlotheimia angulata*, and only last year the writer⁹ referred to this species and other forms of the *angulata-striata* group as typical *Schlotheimia*. At the date of publication, however, this nomenclature was already out of date, and the well-known '*Schlotheimia angulata*,' another of the old zone fossils, will pass into oblivion.

Lange¹⁰ subdivided *Schlotheimia* into three genera, namely, into *Schlotheimia* s.s. (genotype :—*S. princeps* S. Buckman),

¹ 'Expl. Carte Géol. Détaill. France,' Vol. IV., Pl. LXV.

² Loc. cit., pt. II., 1879, Pl. XIV., figs. 5 and 6; pt. IV., 1881, p. 319.

³ Loc. cit. (1876), p. 271.

⁴ 'Handbuch der Palæontologie,' Vol. I., Abt. II., Lief. III., 1884, p. 456, text-fig. 637.

⁵ 'Type Ammonites,' Vol. IV., 1923, Pl. CCCXCV.

⁶ 'Elemente der Palæontologie,' Pt. II., *Cephalopoda*, 1889, p. 433, text-fig. 525.

⁷ 'Beiträge zu einer Revision der Ammoniten des Schwäbischen Jura,' *Jahresh. Ver. Vaterl. Naturh. Württ.*, 1893, p. 225.

⁸ 'Some Lias Ammonites,' *Proc. Cotteswold Nat. Field Club*, Vol. XV. (1906), p. 237.

⁹ 'Ammonites of the Blue Lias,' *Proc. Geol. Assoc.*, Vol. XXXV (1924), p. 198.

¹⁰ 'Über die Pylonotenstufe und die Ammonitenfauna des untersten Lias Norddeutschlands,' *Jahrb. Preuss. Geol. Landesanstalt*, Vol. XLIV. (1923) 1924, pp. 177-207.

into *Scamnoceras* (genotype :— *S. angulatum* [Schlotheim] Quenstedt) and into *Saxoceras* (genotype :— *S. costatum* Lange MS.). Since they all occur in Yorkshire, it may be advisable briefly to review these genera, and it ought also to be mentioned here that the family name *Schlotheimidae*, used previously, must be reinstated, since *Angulatidae*, like *Euclymenia* or *Magnosellaridae* and other such family names, not based on a definite genus, will have to be abandoned.

Schlotheimia s.s., with unequal ribs that tend to disappear on the sides of the outer whorls, occurs rather sparingly on the reefs at Redcar. *S. exocoptycha* (Waehner) already recorded by Mr. Thompson¹ from the Holderness Drift, and by the writer² from Redcar, belongs to this genus, also *S. complanata* v. Koenen and *S. depressa* (Quenstedt) which I have collected, though only in doubtful fragments, at the same locality. Such forms as *S. princeps* S. Buckman, *S. thalassica* (Quenstedt), *S. colubrata* (Zieten), *S. similis* and *S. pseudomoreana* Spath, I have never seen from Yorkshire.

Scamnoceras seems far commoner, and can certainly be collected in numbers on the reefs at Redcar, while from Mr. Thompson's account it may be gathered that specimens are also numerous in the Drift all along the Holderness coast. The typical *Scamnoceras angulatum* (Schlotheim) Quenstedt as restricted by Lange, and here defined (lectotype :— *Ammonites angulatus costatus* Quenstedt, 'Amm. d. Schwäb. Jura.', 1883, Pl. II., fig. 8 only), is not identical with Wright's Lyme Regis example (B.M., No. C. 1921), which is now renamed *Scamnoceras lymense* n. nov. Wright's figure is restored, the ribs being distinct only on the last half-whorl, which is body-chamber. But although the inner whorls are badly preserved, the ribs can be counted, and amount to 35 at 20 mm., 43 at 35 mm., 50 at 70 mm., and 55 at 125 mm. Quenstedt's type, on the other hand, which, according to Pompeckj,³ who figured its suture-line, represents the same individual as Quenstedt's *Ammonites angulatus depressus* of 1849 ('Cephalopoden,' Pl. IV., figs. 2c, d) has only 37 ribs at 64 mm. diameter and a whorl-height of 40 and umbilicus of 37% of the diameter.

Now the writer has seen nothing resembling *Scamnoceras lymense* from Yorkshire, whereas the true *S. angulatum* is not uncommon at Redcar (with the inner whorls generally absent), and has also been found at Robin Hood's Bay (Leckenby Coll., B.M., No. 39679), at 'Whitby' (Ripley

¹ *Loc. cit.* (1913), p. 172.

² *Loc. cit.* (1924), p. 198.

³ *Loc. cit.* (1893), p. 225.

Coll., B.M., No. 17150), and in the Filey Drift (one of the new species of '*Schlotheimia*,' recorded by Mr. Thompson). The suture-lines of the last three examples are here figured (figs. 3*a-c*), and show that there is considerable variability. The development of the immature suture-line of two Redcar

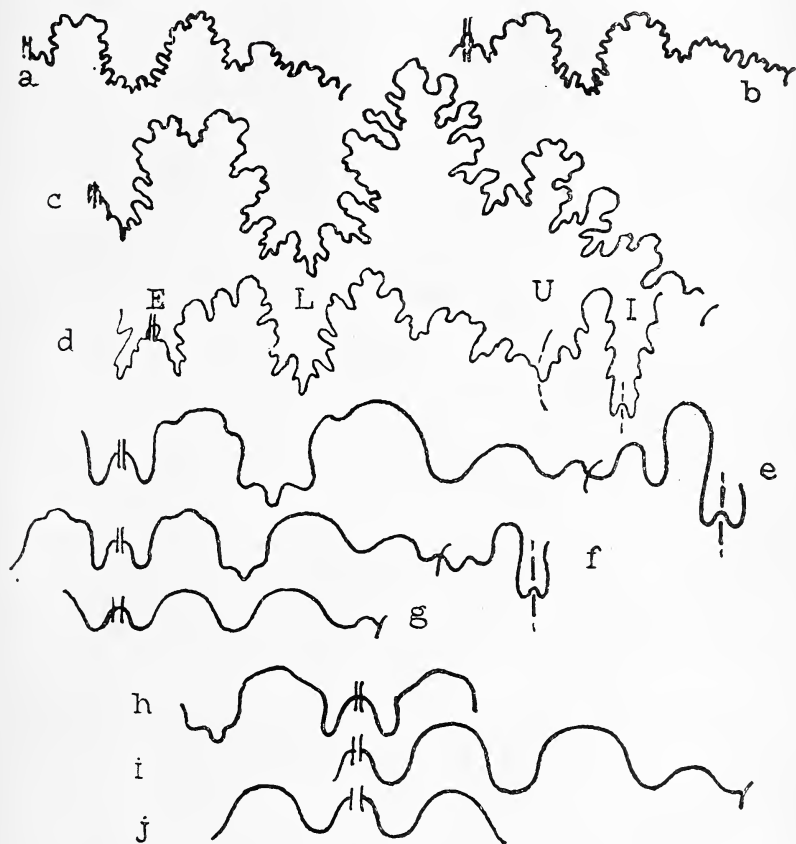


FIG. 3.

Scammoceras angulatum (Schlotheim) Quenstedt sp. : (*a-c*) External suture-lines of examples from the Drift of Filey (Hull Museum, $\times 6$), Robin Hood's Bay (B.M. No. 39679, $\times 5$) and Whitby (B.M. No. 17150, $\times 3.5$); (*d*) Complete suture-line of a German specimen (after Dietz) at a whorl-height of 8 mm. (E=external lobe, L=first lateral lobe, U=umbilical lobe, I=internal lobe); (*e-g*) Immature suture-lines of a Redcar example at diameters of 6, 3 and 1.25 mm.; (*h-j*) Same of another specimen from the same locality, at diameters of 4, 2 and 1.5 mm.

examples (text-figs. 3*e-g* and *h-j*) is also added, and the complete suture-line, at a whorl-height of 8 mm., of a German

example figured by Dietz.¹ Although there is apparent agreement in general appearance, the Filey and Robin Hood's Bay examples are pyritised and evidently came out of a shaly bed, whereas at Redcar complete pyritisation seems unknown. Since Tate and Blake described a thickness of nearly 30 feet, with '*Ammonites angulatus*' practically throughout, it is to be hoped that some local geologist may be attracted by this promising sequence and help in collecting from the various layers. Meanwhile it can only be considered as probable that *Scamnoceras angulatum* and its common companion *S. striatum* (Quenstedt), which includes the two examples of '*Aegoceras angulatum*' in the Blake Collection, referred to in these pages by the late G. C. Crick,² also an unnamed inflated form, come from the upper *angulatus* zone, and that even the *liassicus* beds are probably absent at

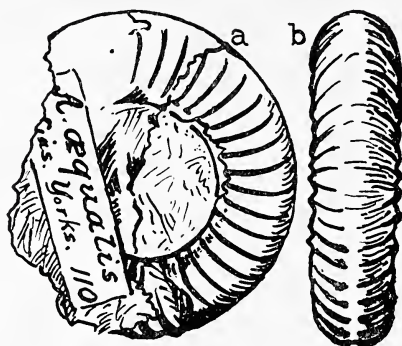


FIG. 4.

Saxoceras æquale (Simpson) nov. Side (a) and peripheral (b) views of Simpson's original example (B.M. No. Cr8109) not previously figured.

Redcar. The second new species recorded by Mr. Thompson is more evolute than *Scamnoceras angulatum*, but pending the publication of figures to illustrate the numerous forms created by Lange, it seems inadvisable to name this single, poorly preserved Drift example.

The genus *Saxoceras* is represented only by the form which had been recorded by Crick³ as '*Ammonites æqualis* Simpson,' and which is now figured for the first time. I had referred to it⁴ as a finely costate form, close to the less dwarfed

¹ 'Untersuch. ü. d. Lobenlinien d. Ammon. d. Lias $\alpha-\gamma$,' *N. Jb. f. Min., etc.*, Beil. Bd. XLVII. (1923), p. 439, text-fig. 30a.

² *Loc. cit.* (1922), p. 273.

³ *Ibid.*, p. 274.

⁴ *Loc. cit.* (1924), p. 196.

S. prometheus (Reynès, 1879, Pl. II., figs. 16-17), and less advanced than *S. gallica* *S. Buckman* (= *Amm. catenatus* De la Beche in d'Orbigny, 1845, Pl. XCIV.). Only the body-chamber of *S. æquale* is preserved (see text-fig. 4), but its periphery shows a return, after a *Schlotheimid* groove, to the *Psiloceras* rounding, which caused the confusion of forms of this group with *Waehneroceras*. '*Schlotheimia* cf. *prometheus*,' recorded by Mr. Buckman,¹ may also belong to *Saxoceras* if allied to Reynès's type, but the form previously figured by the same author,² also *S. stricklandi* and *S. acuticosta*, were compared by Lange to the probably much later *Scamnoceras angulosum*.

One of the '*Schlotheimia*' from the Hull Museum is an immature *Charmasseiceras* of only 12 mm. diameter, and was labelled by Mr. Buckman: '*Schlotheimia* aff. *ventricosa* J. de C. Sowerby sp.' Nothing has been seen that could be compared to *A. antiquatus* Simpson, which, as has already been mentioned (*supra* p. 112), was identified by Fox-Strangways with d'Orbigny's *Amm. charmassei*. Blake³ also described Simpson's form as a fragment of the adult *A. charmassei*, but his collection in the British Museum (or, indeed, the Bean, Ripley or any other collection), as Crick has already mentioned, does not contain a single example of *Charmasseiceras* from Yorkshire. Mr. Buckman, however, has recorded *Schlotheimia ventricosa* and *S. compta* (J. de C. Sowerby in Canavari), from Redcar, as being in the Tate Collection (Museum of Practical Geology), in addition to *S. charmassei*. The figured example of the latter⁴ is an immature *Charmasseiceras* like the Hull specimen above referred to, and the *Schlotheimia trapezoidalis* (Sowerby) recorded by Mr. Thompson probably belongs to the same group. '*Ammonites sulcatus* Simpson' was considered by Blake to be 'the young of the ordinary form of *A. charmassei*.' Mr. Buckman⁵ has now figured Simpson's holotype and compared it to forms of *Angulaticeras* (=group of *Schlotheimia lacunata* J. Buckman sp.), but if Blake's identification with d'Orbigny's *Amm. laigneletii*⁶ is at all near the mark, the reference of '*Schlotheimia*' *sulcata* to this genus is doubtful. Other species of *Angulaticeras* from the '*stellare*' and *oxynotum* zones of Yorkshire are recorded in the Whitby Memoir.⁷

¹ *Loc. cit.* (Whitby Memoir, 1915), p. 100.

² *S. Buckman, loc. cit.* (1906), p. 236, Pl. XI., figs. 3, 4.

³ In Tate and Blake, 1876, p. 272.

⁴ *Loc. cit.* (1906), p. 239, pl. X., figs. 19-20.

⁵ *Yorkshire Type Ammonites*, Vol. I. (1911), Pl. XXXVIII.

⁶ *Pal. Franç., Terr. Jurass.*, Vol. I., 1845, Pl. XCII., figs. 3-4.

⁷ *Loc. cit.* (1915), p. 99.

One important genus of the family Schlotheimidæ has only lately been discovered by Mr. Thompson¹ in the Yorkshire Lias, namely *Waehneroceras*. The preservation of his two Cliff examples, in a limestone, crystalline or oyster-coated, and without trace of the suture-line, is not favourable to exact identification. The larger example figured by Mr. Thompson (enlarged $\times \frac{10}{9}$) is only slightly less closely costate, but more compressed, than the Chadbury specimen (B.M., No. C. 17825) recorded by the writer² as allied to *W. curvior natum* and *W. haploptychum* (Waehner). The smaller specimen seems to be more closely comparable, in whorl-shape and ribbing, to the *Psiloceras* (*Euphyllites*?) described by me³ from New Zealand, than to typical species of *Waehneroceras* of the *tenerum-subangulare* group to which belongs the first example and *W. portlocki* (Wright), taken as characteristic of the upper *planorbis* zone.⁴ Since the inner whorls are not shown and this second example is probably mature at the comparatively small diameter of 33 mm., it is, indeed, possible that it is closer to *Psiloceras* than to *Waehneroceras* in the restricted sense. In any case both the Cliff specimens are of Upper Psiloceratan age, the beds of which, with those of the earlier three-quarters of the Schlotheimian age, are not now known *in situ* anywhere on the Yorkshire coast.

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According to *The Yorkshire Herald*, a Yorkshire tortoise recently laid two eggs on a Sunday afternoon. They have been inspected by *The Yorkshire Herald* and *The Yorkshire Evening Press*. The eggs are to be incubated and the young (if any) presented to a Yorkshire museum. Some 'windfall.'

The third *Annual Report of the Worthing Archæological Society* contains an illustrated report of Discoveries made during 1924, at the Flint Pit of the Corporation, in Waterworks Lane, Broadwater; and a record of the work of the Society during the year. The Society has two hundred and fifty members.

The Report of *The Marlborough College Natural History Society* for 1924, being the 73rd, would be creditable to many county societies. In its 150 pages are most important monographs and records, and the editor is to be congratulated upon securing contributions on subjects rarely touched by school societies. Besides the Reports of the various sections, there are papers on 'Martinsell,' a fortified mound; Wansdyke, an early earthwork; 'Surface Flint Implements'; Lists of Diptera, Hymenoptera and other 'neglected orders'; '*Chirocephalus diaphanus*' (with several illustrations); Fungi, and various notes on additional records in numerous directions. The Report concludes with the usual useful meteorological statistics, and a 'Summary of Sixty Years' Observations.'

¹ *The Naturalist*, February, 1925, p. 43.

² *Loc. cit.* (1924), p. 195.

³ 'Ammonites from New Zealand,' *Quart. Journ. Geol. Soc.*, Vol. LXXIX. (1923), pp. 288-90, pl. XII., figs. 1-4.

⁴ Spath, 'Ammonites of the Blue Lias,' *loc. cit.* (1924), p. 188.

THE GRASSLANDS OF YORKSHIRE COAL MEASURE AND LIMESTONE SOILS.

THOMAS SWARBRICK, M.Sc.

THIS analysis has been carried out on Parlington Deer Park, of about 250 acres, which forms part of the Parlington Estate, about nine miles east of Leeds travelling towards Selby. Geologically it is at the point where the northern edge of the Yorkshire coalfield meets the outcrop of the Yorkshire magnesian limestone, so that in it we have the opportunity of studying the vegetation upon two distinct geological formations. The object of this analysis is to record the characteristic vegetation of these two formations and the ways in which they differ. Previous to these analyses the land had been untreated in any way within living memory.

The outstanding feature was the contrast in the whole vegetation between the two respective formations. The limestone area was covered by a rough, coarse, dry, light-green herbage. It was all more or less tall herbage, yet there were patches which were covered by a darker and shorter vegetation. Sharply separated from this rough herbage was that of the coal-measures which was much shorter and had a brown carpet-like appearance. Another difference was very noticeable to the feet. The coal-measure turf gave one the impression of walking on a thick carpet, while contrasted with this was the hard solid effect given by the turf upon the limestone area.

The springiness of the coal-measure turf is due to an accumulation of decaying vegetable matter which varies from two to four inches in thickness. This 'mat' is entirely absent from the limestone area.

The soil is a very heavy cold loam, tending to be more free on the limestone area. For the most part the land is dry and well drained. A few wet places occur on the coal-measure, but none was taken as a place for analysis. On December 6th, 1921, the soil was sampled by Professor Comber and the writer, and was subsequently tested for lime requirement and pH value. The coal-measure soil has a lime requirement of 23 cwts. per acre, the limestone soil nil. The pH values were interesting. With Professor Comber's* Potassium salicylate test the coal-measure soil gave a deep red colouration indicating a sour soil, while the limestone soil gave no colouration, yet the respective pH values were—

Coal-measure	...	6.7
Limestone Area	...	7.3

* *Journal Agr. Sci.*, Vol. X., Part 4, 1920, p. 420.

The idea that sourness is not due entirely to Hydrogen ion concentration is substantiated by these figures. There does not appear to be any outstanding feature in the mechanical analysis of the soil, which is the same for both formations, and is as follows :—

Coarse Sand	24·5%
Fine	„	...	4·4%
Coarse Silt	30·6%
Fine	„	...	15·7%
Clay	12·9%

The summer of 1921 was very dry, but by December 6th, when the above soil samples were taken, there had been considerable rainfall. On the limestone area the rain had penetrated to a considerable depth, so that it was comparatively easy to get a core of soil, but over the Coal-measures the soil below the mat was still so dry that it was almost impossible to get a core, despite the fact that it was possible to squeeze water out of the mat. On December 7th an analysis of the top four inches of the two respective soils was made for water content, with the following results :—

Coal-measure (2 in. of mat)	...	32·4%	water
Limestone (no mat)	...	17·6%	„

It is obvious, therefore, that this mat is an important factor in determining the vegetation of the coal-measures owing to its effect upon the water supply. It appears that soil conditions may induce the formation of a layer of semi-decayed vegetable matter, which in its turn may become the dominant factor deciding plant distribution.

The quadrat method of analysis was adopted, using a frame of 400 square inches. The distribution given in the following tables is according to the *area* covered by each grass. A considerable difficulty arose over the tufts and barer places already mentioned, as it was obvious that the flora of the two were quite different. To overcome this, a general survey was made, and it was computed that on the limestone area the tufted areas were twice as extensive as the barer ones. It was decided therefore to take three analyses for each group of figures, two in the tufted areas and one in the barer region, and to average these, thereby obtaining a general average of the whole vegetation. The coal-measures did not present any such difficulty, as its herbage had a uniform distribution, but to obtain results which would be comparable with those of the limestone area three analyses were taken and averaged. In tables I. and II. which follow, the analyses are grouped in this way, each vertical column being a separate analysis. Tabulated in this way, it is possible to contrast the flora of the tufts with that of the barer areas. When this is done, it will be realised that the average of the group is a

Table I.—LIMESTONE FORMATION.

NAME OF GRASS.	Analysis 1.			Analysis 2.			Analysis 3.			Analysis 4.							
	Tuft.	Tuft.	Bare. Average.	Tuft.	Tuft.	Bare. Average.	Tuft.	Tuft.	Bare. Average.	Tuft.	Tuft.	Bare. Average.					
<i>Brachypodium pinnatum</i> ...	45	45	10	33	40	18	31	30	25	15	23	40	45	10	32		
<i>Bromus erectus</i>	8	6	16	20	20	5	15	25	30	5	20	15	16	<1	10	
<i>Festuca ovina</i>	10	15	35	15	17	30	20	20	25	45	30	25	20	42	30	
<i>Brisa media</i>	25	20	15	20	12	10	8	10	8	—	5	5	10	—	5	
<i>Trifolium repens</i>	1	2	12	5	3	1	20	8	5	5	20	10	3	3	22	10
<i>Luzula campestris</i>	—	3	3	2	2	1	4	3	3	3	8	5	3	2	10	3
<i>Lotus corniculatus</i>	—	—	1	<1	—	2	3	2	1	1	1	1	1	—	2	1
<i>Avena flavescens</i>	5	8	5	6	6	6	4	6	2	1	3	2	3	3	3	3
<i>Dactylis glomerata</i>	—	—	<1	<1	—	—	3	1	—	—	<1	<1	—	—	5	1'5
<i>Poa pratensis</i>	—	—	<1	<1	—	—	2	<1	—	—	—	—	—	—	2	<1
Total % estimated	...	94	99	97	—	91	97	97	—	94	98	97	—	95	99	96	—

Table II.—COAL-MEASURE FORMATION.

NAME OF GRASS.	Analysis I.			Analysis II.			Analysis III.		
	(a)	(b)	(c)	Average	(a)	(b)	(c)	Average	
<i>Festuca ovina</i> ...	25	28	25	26	30	30	28	30	25 55 30 36
<i>Agrostis</i> Spp. ...	30	35	30	31	30	40	30	35	30 30 35 31
<i>Holcus lanatus</i> ...	15	10	15	13	15	10	20	15	10 2 10 7
<i>Luzula campestris</i> ...	8	5	7	6	6	5	6	5	4 4 8 5
<i>Rumex acetosella</i> ...	3	2	3	2	4	3	2	3	4 3 4 3
<i>Aira caespitosa</i> ...	5	4	6	5	3	5	3	4	18 — 6 8
<i>Trifolium repens</i> ...	2	3	2	2	5	2	3	3	3 1 1 1
<i>Triodia decumbens</i> ...	2	1	2	2	2	1	—	1	— 1 — 1
<i>Ranunculus repens</i> ...	1	3	3	2	2	2	2	2	2 — 1 1
Total % estimated ...	91	91	93	—	97	98	94	—	96 96 95 —

more or less hypothetical figure, and any one analysis taken on the limestone area might show very wide variation from it. The greater the number of analyses taken, however, the nearer would the average of them approach that indicated in the second column of Table III.

Table I. gives the results of four groups of analyses on the limestone formation. As already indicated, each group consists of three separate analyses, two being of the tufted areas and one of the bare. These are set out at the head of the table. The difference in the vegetation between them is striking, particularly as regards the *Trifolium repens*, *Festuca ovina*, *Dactylis glomerata* and *Brachypodium pinnatum* contents.

The following plants were also listed, as occurring upon the limestone formation, the order being that of relative frequency :—*Linum catharticum*, *Veronica chamaedrys*, *Potentilla erecta*, *Campanula rotundifolia*, *Achillea millefolium*, *Cerastium vulgatum*, *Bromus mollis*, *Lathyrus pratensis*, *Prunella vulgaris*, *Plantago lanceolata*, *Leontodon autumnalis*, *Phleum pratense*, *Lolium perenne*, *Agrostis stolonifera*.

Cynosurus cristatus. *Prunella vulgaris*. *Leontodon autumnalis*.

Potentilla erecta. *Molina coerulea*. *Achillea Millefolium*.

Lotus corniculatus. *Avena pratensis*. *Lolium perenne*.

Cerastium vulgatum. *Avena pubescens*. Moss.

Table III.—COMPARATIVE TABLE.

	LIMESTONE FORMATIONS.		COAL MEASURE.
	BRAMHAM PARK.	PARLINGTON PARK.	PARLINGTON PARK.
<i>Brachypodium pinnatum</i> ...	44·0	35·0	A few isolated tufts
<i>Bromus erectus</i> ...	15·0	16·0	+
<i>Festuca ovina</i> ...	22·7	22·0	30
<i>Brisa media</i> ...	0·5	8·0	—
<i>Agrostis</i> Spp. ...	4·1	+	39
<i>Sesleria coerulea</i> ...	3·3	+	+
<i>Dactylis glomerata</i> ...	2·5	0·5	+
<i>Holcus lanatus</i> ...	1·3	+	6
<i>Potentilla erecta</i> ...	·3	+	—
<i>Prunella vulgaris</i> ...	+	+	+
<i>Lotus corniculatus</i> ...	T	1·5	+
<i>Triodia decumbens</i> ...	0·3	—	1·0
<i>Trifolium repens</i> ...	·9	5·5	2·0
<i>Luzula campestris</i> ...	—	1·6	5·0
<i>Avena flavescens</i> ...	—	4·0	—
<i>Poa pratensis</i> ...	—	0·2	+
<i>Aira caespitosa</i> ...	—	—	6·0
<i>Rumex acetosella</i> ...	—	—	3·0
<i>Anthoxanthum odoratum</i> ...	—	+	1·0

Table III. gives the averages of two analyses on magnesian limestone and one on coal-measure. The analysis of Branham Park was conducted on exactly similar lines to that at Parlington Park. Bramham Park is about 11 miles from Leeds travelling towards York, and is on the same belt of limestone as Parlington, and like it is a rough uncultivated area. The similarities in the vegetation of the two limestone areas are so marked as to suggest that the analyses will be typical of the other Yorkshire magnesian limestone soils where these are not being actively cultivated. The conclusions may be summarised as follows :—

(1) The characteristic grasses of the limestone formation are :—

Brachypodium pinnatum,
Bromus erectus,
Brisa media,
Avena flavescens,

with a good percentage (5%) of leguminous plants also present.

(2) The characteristic grasses of the coal-measure are :—

Agrostis Spp.,
Aira caespitosa,
Holcus lanatus,
Triodia decumbens,

with *Rumex acetosella*,
 and an almost negligible amount of *Trifolium repens*.

(3) Both geological formations are dominated by grasses of very little value both as far as crop producing power and food value are concerned.

(4) Plants occurring only in small quantities are liable to extreme fluctuations as regards frequency and distribution.

It has also been possible to study the effects of various manurial treatments, particularly applications of Basic Slag and Ground Magnesian Limestone, upon plots laid down under 'The Ministry of Agriculture's Grassland Improvement Scheme' on the coal-measure formation at Parlington Park. It is not possible here to give tables of figures, but the following conclusions are interesting :—

(a) An application of 10 cwts. per acre of 38% Basic Slag has within the space of fifteen months caused not only an increase of 100% in the *Trifolium repens* content, but has also stimulated it from a half-dead condition into active growth. Basic Slag has, however, produced no change in the grass flora, its action being confined to the clover constituent.

- (b) Four tons of Ground Magnesian Limestone per acre has in the same time produced no detectable change in the grass flora, but has almost eliminated the mosses.
- (c) Both Basic Slag and Ground Magnesian Limestone were able to assist the grasses to withstand the drought of 1921.

I take this opportunity of expressing my best thanks to Dr. W. H. Pearsall for his valuable help and suggestions in drawing up these analyses into their present form. Also my thanks are due to the Department of Agriculture of the University of Leeds for facilities to carry out this work ; to the staff of the Department of Agricultural Botany, and to Professor Comber of the Department of Agricultural Chemistry.

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Hippocrepis comosa Linn., an East Riding Plant.—

On 26th May ult. I received from Rev. G. T. W. Purchas, of Westow Vicarage, near Kirkham Abbey, specimens of this species which Miss G. F. Purchas had discovered growing on Langton Wold. This makes the first record of a not very common plant (45 out of 112 Watsonian vice-counties) for the East Riding of Yorkshire, V.C. 61. Mr. Purchas assures me that there is plenty of the plant on a portion of the wold that has probably never been under the plough, and from the robustness of the specimens sent I think the *Hippocrepis* must have long been established there.—J. FRASER ROBINSON.

New Exposure in the Lower Inferior Oolites at South Cave, E. Yorks.—A small excavation has recently been made, evidently with the object of obtaining stone, immediately to the west of the cutting at South Cave Railway Station where the Millepore Oolite is exposed. The new excavation is in a field almost on the level of the railway line, and has extended to a depth of six or eight feet where standing water has prevented further progress. The beds lie immediately beneath the Millepore Oolite. The rock is a very hard close-textured limestone, blue hearted, but weathered white, the beds of limestone being divided by marly partings. Fossils were not uncommon, but unfortunately no trace of an ammonite has so far been found. Specimen obtained at a recent excursion of Hull geologists were submitted to the Geological Survey, Jermyn Street, and after examination by his colleagues, Mr. C. P. Chatwin reports that the specimens consist of *Eopecten abjectus* (Phil.), *Lima (Limea) duplicata* J. DeC. Sow., and *camptonectes* sp., *Lima (Plagiostoma) strigillata* Laube, *Camptonectes lens* (J. Sow.), *Pinna cuneata* (Phil.). There is also a small sea-urchin (? *Cidaris*), but it is indeterminate.—T. SHEPPARD.

MIDDLETON-IN-TEESDALE AND ITS NATURAL HISTORY.

W. H. PEARSALL, D.Sc., F.L.S., AND F. A. MASON, F.R.M.S.

WITH the exception of the Bingley excursion, in 1921, which one recollects as a happy procession of West Riding naturalists rather than as a meeting for field work, no excursion in recent years has proved so attractive as that to Middleton-in-Teesdale, held during Whitsuntide, May 30th to June 1st. In addition to a large gathering of members and associates of the Union, there were present members of the Yorkshire Geological Society, and of the Wallis Club (Northumberland). The difficulties encountered in securing accommodation precluded a closer co-operation with the Wallis Club, and, indeed, was responsible for reducing the attendance of its members. Its President (Dr. J. W. Harrison), Mr. Temperley, and others were staying in the district, and Dr. Kathleen Blackburn participated in most of the field excursions.

Among the geologists present were Mr. Young, of Derby, and those regular attenders of the Union's own meetings, Miss M. A. Johnstone, B.Sc., and Messrs. Jno. Holmes and B. Hobson, M.Sc. The last named has kindly furnished some notes on the excursions, of which use is made in these preliminary remarks, but the geology of the district has been so carefully worked and recorded by Mr. J. J. Burton, that anything more than passing reference is unnecessary. Members, and particularly the older ones, were delighted to meet Mr. Burton, at Langdon Beck Hotel, after their return from Cronkley, and, over a welcome cup of tea, they had the pleasure of discussing earlier field days o'er again.

The weather was mixed, mainly wet, although this only reacted adversely on the work of the entomologists, of whom we had a useful trio in Messrs. J. M. Brown, W. J. Fordham and M. L. Thompson; as it was some noteworthy captures were made, including at least one new British record.

Saturday was devoted to a visit to High Force, the well known waterfall of the Tees caused by the intrusive sheet of basaltic rock known as the Whin Sill, which is here nearly 30 ft. thick. The return journey was made on the Yorkshire side of the river, from which several smaller falls and rapids, due to Whin Sill in the river bed, were observed. In such a thoroughly well-worked district, it was not expected to add much to our knowledge of the flora and fauna, except among groups of organisms little worked, and some of those best qualified for this spent a considerable part of their time in a Dutch barn sheltering from a pitiless rain.

On Sunday the geologists walked by the Eggleston road to East Skears Beck, where, in a disused quarry a few hundred yards above the road bridge (on the Blackston road), a fine exposure of the Cleveland basaltic dyke was seen. It has, writes Mr. Hobson, "altered the grits at the contact into a rock resembling quartzite." The naturalists contented themselves along a short stretch of Hudeshope Beck, near to head-quarters, where some useful work was done.

Monday's excursion was to Cronkley Bridge for White Force and Cronkley Fell, and Falcon Clints. Crossing the swollen Maize Beck, in various ways, the party then proceeded to Cauldron Snout, a fine cascade where the Whin Sill is rudely columnar, and, crossing by the footbridge, returned to Langdon Beck Hotel by way of Widdy Bank.

A General Meeting, over which the President (Prof. J. H. Priestley, B.Sc.) presided, was held on Monday evening. Reports were submitted, and these are given below. Votes of thanks to the local Secretary, Mr. J. Hartshorn, and to Mr. A. Nicholson, as leader, were unanimously accorded. The Hon. Secretary referred to the valuable help rendered by the Darlington and Teesdale Naturalists through their Hon. Secretary,

Mr. J. E. Nowers, and to the interest shown in our visit by the Forest Schoolmistress, Mrs. Arnott. Six new members were elected.

PLANT ECOLOGY (A. Malins Smith, M.A.).—Of the plant associations seen on the excursions mention must first be made of the Juniper heath association. This seems to be limited in its distribution to the outcrop of the Whin Sill. It is found growing on the dolerite at High Force and at Falcon Clints, and there occupies niches in the vertical face of these precipitous cliffs. It is found still more abundantly on gently sloping ground above High Force, and the association extends down the river to Newbiggin and also up the White Force beck to the waterfall. In the greater part of its local area the Juniper is on ground easily accessible to sheep, and they feed freely among it. It is scarcely possible to agree, therefore, with the suggestion of Smith and Woodhead in their report on a previous excursion (*The Naturalist*, 1910) that the Juniper is limited to the Whin Sill, because the precipitous cliffs of this rock are inaccessible to sheep. There is no sign that the tree is injured by sheep, and the local inhabitants of the area are of opinion that sheep do not eat the Juniper. The character of another woodland enemy—the rabbit—cannot so easily be cleared. Some smaller Juniper bushes were seen with the close-cropped hummocky form characteristic of rabbit attack, and it is not improbable that at the present time the rabbit is an effective factor in the destruction of young trees.

In its highest development near High Force, the association forms a fairly close scrub with trees reaching 8-10 ft. in height, but there are many spaces between, and the association, viewed as a whole, is open, with much intervening space between the trees.

Although Juniper occurs on many different geological substrata, yet it tends on the whole to favour calcareous soils, and such a pure Juniper scrub as the one under consideration is only known elsewhere on the chalk (Tansley, 'Types of British Vegetation,' p. 171). It would be expected, therefore, that the soil of this association would be basic.*

Among the undergrowth beneath the Juniper the following plants were found :—

<i>Oxalis acetosella</i> .	<i>Mercurialis perennis</i> .
<i>Adoxa moschatellina</i> .	<i>Scilla nulans</i> .
<i>Polypodium Phegopteris</i> .	<i>P. Dryopteris</i> .
<i>Cardamine flexuosa</i> .	

We now turn to the status of the Juniper scrub as progressive or retrogressive. The open spaces between the shrubs are dominated by an acidic vegetation of *Calluna vulgaris*, *Vaccinium myrtillus* and bracken. Much more observation is needed than could be crowded into one short visit, but there are certain indications that the Juniper scrub is retrogressive, and is gradually giving way before the ling association.

(1) Dying and dead Junipers are not infrequent.

(2) Seedling and young trees are very rare (the writer only found one, which was growing on the sugar-limestone cliff at White Force). Indeed the closed association of ling between the Juniper scarcely allows of the germination of the seeds. It would be interesting in this connection—as suggested by a member of the Yorkshire Naturalists' Union at the meeting on Whit Monday—to clear and fence an area of the ling among the Junipers and see how many young Juniper trees would develop there.

(3) In places prostrate and moribund Juniper bushes were closely surrounded by vigorous ling.

From these indications it is probable that the Juniper scrub is now

* Juniper is one of those plants which may form flourishing communities on either limestone or acid soils. There are fine Juniper heaths of the latter sort (with ling and other heathy shrubs) in the Lake District (as for example on Yewbarrow) and in Yorkshire, there are smaller areas on Moughton of this type.—W.H.P.

retrogressive, and is destined to give way before the invasion of the ling association on soil steadily becoming more acid, probably by leaching. This conclusion needs much further observation for its full establishment, but the change indicated is similar to that very widespread acidification of woodlands going on in many parts of the country and resulting in the replacement of woodland by another formation—the heath or moor—characteristic of acid soils.

The second association, specially characteristic of Upper Teesdale, is that developed on the sugar-limestone both above and below the Whin Sill on Cronkley and Widdybank Fells. Here are most of the botanical rarities for which Teesdale is famous, including the beautiful blue *Gentiana verna*. But after the description given by Smith and Woodhead, it only remains to emphasise the very peculiar nature of the soil on which this association is developed. The sugar-limestone weathers to a large-grained soil with the physical character of sand, but calcareous, and therefore different in its basic character from any siliceous sand. To this unique soil—a direct consequence of the Whin Sill intrusion—can be attributed the very specialised nature of the flora. The soil is porous and well-drained, and the vegetation very xerophytic. The close short turf on the sugar limestone of Cronkley Fell, chiefly of *Festuca ovina*, in which are found dwarf plants of *Draba incana*, *Gentiana verna*, *Arenaria verna*, *Dryas octopetala* and *Helianthemum Chamæcistus*, is, in its reduced mat-like growth-form, the direct expression of the porous soil and the wind-swept situation.

Some controversy arose among the geologists as to the statement of Smith and Woodhead (*The Naturalist*, 1910) that this unique association is developed 'in the main over an unglaciated area.' Though the balance of opinion would allow the statement to represent the facts correctly, some took exception to it on the ground that evidence of ice action had been found on the top of Cronkley Fell. There seems at present, however, no reason to contest the statement that this association is 'a relic of a pre-glacial flora.' Since the competition of the post-glacial flora, the pre-glacial has been limited to certain special elevations and soils. In these there is no reason to suppose it to be in any way moribund, and there is every evidence that so long as the special soil and situation are present, the plants of this association will continue to hold their own.

The curious distribution of the alpine between the two fells which expose sugar-limestone, Cronkley and Widdybank, so that, for example, *Viola rupestris* and *Arenaria uliginosa* are found on Widdybank, not on Cronkley, while *Helianthemum canum*, *Dryas octopetala* and *Polygala amara* are found on Cronkley, not on Widdybank, is no doubt an instance of the chance distribution of plants of restricted area which would occur as the result of competition due to the advance of the post-glacial flora.

Two minor but striking features of the ecology of the district are: (1) the abundant occurrence of *Anemone nemorosa* in the open, whereas it occurs elsewhere usually as a plant of the woodland undergrowth. Probably all it requires is a moist atmosphere, and this, which in drier districts is found only under the shade of trees, is obtained, in this area of high rainfall and much mist, in the open; (2) the occurrence of *Bartsia alpina*, usually a plant of wet alpine rock ledges, in bogs. This is not so unusual as it seems, for the so-called calcareous bogs of Upper Teesdale are not bogs in the usual sense at all, but places where abundant water oozes out over a stony soil. There is no accumulation of peat, and the situation is really very similar to that of a wet alpine rock-ledge.

BOTANY (A. Malins Smith, M.A.). **FLOWERING PLANTS.**—The combination of the rich flora of a limestone district with the special alpine varieties of the limestone fells provided a long list of flowering plants which it is unnecessary to give in full. Among the more noteworthy plants collected by various members of the party were *Trollius europæus*,

Thalictrum alpinum, *Draba incana*, *Thlaspi alpestre* var. *occitanicum*, *Viola rupestris*, *Arenaria verna*, *Geranium sylvaticum*, *Rubus saxatilis*, *Rubus chamæmorus*, *Potentilla fruticosa*, *Dryas octopetala*, *Saxifraga stellaris*, *S. aizoides*, *Peucedanum Ostruthium*, *Antennaria dioica*, *Serratula tinctoria* var. *integrifolia*, *Primula farinosa*, *Gentiana verna*, *Bartsia alpina*, *Plantago maritima*, *Convallaria majalis*, *Tofieldia palustris*, *Paris quadrifolia*, *Blysmus compressus*, *Melica nutans*, *Sesleria cærulea*.

VASCULAR CRYPTOGRAMS.—*Cryptogramme crispa*, *Aspidium filix-mas* var. *Borreri*, *Botrychium Lunaria*, *Ophioglossum vulgatum*, *Lycopodium selago*, *Selaginella selaginoides*.

ALGÆ.—It was too early for the majority of the Conjugatæ to be found in conjugation, when alone the species can be determined. The following were collected indiscriminately on both sides of the river in Yorkshire and in Durham :—*Draparnaldia plumosa*, *Chaetophora elegans*, *Ulothrix zonata*, *Mougeotia viridis*, *Spirogyra varians*, Sp. (*Choaspiis*) *stictica*, *Oedogonium Itzigsohnii*, *Vaucheria terrestris*, *Trentepohlia aurea*, *Synura uvella*.

The most noteworthy feature is the finding of *Oedogonium Itzigsohnii*, an addition to the very few localities listed for this alga in West's Alga-flora of Yorks. This species occurred in its usual environment among Sphagnum.

ENTOMOLOGY (J. M. Brown, B.Sc.).—Dull and stormy weather is not favourable to insect life, and most orders were particularly scarce ; for example, only one species of butterfly—the Green-veined White—was noticed. By the middle of the week, however, matters improved, and those who stayed were able to obtain better results. It was remarkable how rapidly the change in the weather affected some species. Weevils, such as *Phyllobius oblongus*, and the common green species which were not noticed at the beginning of the week, became extraordinarily abundant, while Stone-flies and Caddis-flies were emerging in large numbers.

HEMIPTERA.—It was rather early in the season for these insects, the result being that few were seen in the perfect state, while more immature specimens were taken. The following were recorded :—

HETEROPTERA.

Anthocoris confusus Reut.

A. nemorum L.

Tetraphleps bicuspis H.S.

Stenodema holsatum F.

Dicyphus stachydis Reut.

Harporocera thoracica Fall. (immat.).

Velia currens F.

Corixa nigrolineata Fieb.

C. præusta Fieb.

C. carinata Sahlb., in a pool on Cronkley Fell. This is a new county record.

HOMOPTERA.

Athysanus brevipennis Kbm.

Delphax difficilis Edw.

D. discolor Boh.

Aphalara nebulosa Zett. (immat.).

COLLEMBOLA.—Several of these insects were collected, but they were not as plentiful as was to be expected, and most of those taken were common forms. The most interesting species obtained occurred in moss growing on the trunk of an oak, and proved to be *Xenylla bórneri* Axels., a species not previously recorded in Britain, though I have taken it recently in Derbyshire.

The following species were taken :—

Achorutes armatus (Nic.).

A. purpurescens Lubb.

Xenylla maritima Tullb.

X. bórneri Axels., a new British record.

Onychiurus armatus (Tullb.).

Tullbergia krausbaueri (Born.).

Frisea mirabilis (Tullb.).

Folsomia quadrioculata (Tullb.).

F. fimetarias (L.).

Isotoma sensibilis Tullb.

I. arborea L.

I. viridis Bourl.

I. grisea Schaff.

Isotomurus palustris (Mull.).

Tomocerus minor (Lubb.).

- Entomobrya albocincta* (Templ.). *Sminthurinus aureus* var. *ochropus*
E. nicoleti (Lubb.). (Reut.).
E. nivalis (L.). *Bourletiella bicinctus* var. *repanda*
Lepidocyrtus lanuginosus (Gmel.). (Agren.).
Orchesella cincta (L.) and var. *vaga* *Sminthurus viridis* (L.).
(L.). *Dicyrtomina minuta* (O. Fabr.) and
Heteromurus nitidus Templ. var. *ornata* (Lubb.).

THYSANURA.—The only species taken was *Campodea staphylinus* Westw.

COCCIDÆ (Scale insects).—The Scale insect, *Orthezia cataphracta* (Shaw) was fairly plentiful on *Polytrichum* in the neighbourhood of White Force. This is one of the few Coccids that can lay claim to any beauty, the surface of the female being glistening white owing to the secretion of segmentally-arranged plates of wax.

MOLLUSCA (Greevz Fysher).—The following species, verified by Mr. J. W. Taylor, M.Sc., were obtained in a comparatively small area near headquarters (on the Durham side of the Tees) :—

- A. ater* and var. *albolateralis*. *Helix nemoralis* var. *carnea* 12345,
Limax maximus. (12)345, 02345, and var. *libellula*
L. cinereo-niger. 12045.
L. arborum. *H. hortensis* var. *lutea* 12345.
Agriolimax agrestis. *Ena obscura*.
Pyramidula rotundata. *Clausilia bidentata* and var.
P. rupestris. *cravenensis*.
Hyalinia lucida. *Clausilia laminata*.
H. cellaria. *Zua lubrica*.
H. nitidula. *Azece tridens*.
H. alliaria. *Pupa umbilicata* var. *crassilabris*.
Hygromia hispida. *Limnæa truncatula*.
H. striolata. *Ancylus fluviatilis*.
Helicigona arbustorum and var.
flavescens.

Attempts to observe aquatic species were almost futile, two species alone being noted.

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YORKSHIRE BRYOLOGISTS AT INGLETON.

F. E. MILSOM.

A SUCCESSFUL meeting of the Bryological Section of the Yorkshire Naturalists' Union was held during the Easter week-end at Ingleton. The headquarters were at the Ingleborough Hotel, where, as usual, members were treated right royally. The section was honoured by the presence, as visitors, of Messrs. D. A. Jones, M.Sc. (Wrexham), and A. Sutton (London), of the British Bryological Society. The help and inspiration of these gentlemen was invaluable, and had its effect both on the enthusiasm and the work done during the week-end. The section was further honoured by the presence of the President of the Union (Prof. J. H. Priestley).

On Good Friday, Ingleborough was climbed *via* Crina Bottom, the remaining days being spent in thoroughly investigating the Ingleton glens. The weather was uniformly kind, there being practically no rain, but enough moisture to prevent plants from being too dried up.

The party broke up officially on Tuesday morning, but a small number utilised that day in 'discovering' Black Force (V.C. 65), working from Low Gill Station. The fall was found to be still there, and investigation, though somewhat hazardous, yielded some interesting specimens. Black Force is somewhat similar to Cautley Spout, the stream descending a

steep hillside in a more or less slaty bed for about 1000 feet. The vertical rocks by the sides of the stream were covered with masses of *Hymenophyllum unilaterale*, *Saxifraga azoides* was abundant, and *Pyrola secunda* was also present.

In the following list, V.C. 64 refers to Ingleborough and the Ingleton glens, with the exception of *Pylaisia polyantha* (thorn hedges near Bentham), and *Zygodon gracilis* (Clapdale). V.C. 65 refers to Black Force and the Low Gill fells as far as the Yorkshire boundary.

MOSESSES.

<i>Andreaea alpina</i>	64
<i>Diphyscium foliosum</i> var. <i>acutifolium</i>	64, 65
<i>Polytrichum nanum</i>	64
<i>Pleuridium axillare</i>	64
<i>Seligeria pusilla</i>	64
<i>Brachyodus trichodes</i>	65
<i>Rhabdoweisia fugax</i>	64, 65
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Buzzard in East Yorkshire in Roman Times.—In excavating the site of a Roman Villa at Harpham a little while ago (see *Hull Museum Publication*, No. 23), several bones were obtained, principally of ox, sheep, pig, etc. Among them, however, was the bone of a bird, and on submitting this to Mr. E. T. Newton, F.R.S., he informs me it is undoubtedly that of a Buzzard. This is a very early record of the species in East Yorkshire, and it is also remarkable that the only instance of bones of a Falcon found with an ancient British interment occurred in a barrow at Kelleythorpe, which is quite close to Harpham. In this case the human body in the grave had evidently been that of a hawker, as a stone plate with studs was found on the bones of the wrist, evidently as a protection against the claws of the hawk, and the skull of the bird also occurred in the same grave. The objects were particularly well preserved as the remains occurred in a stone cist.—T. SHEPPARD.

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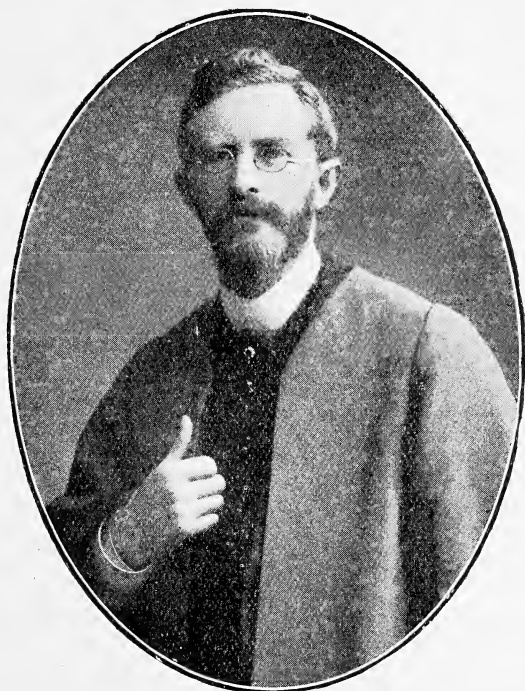
The Lancashire and Cheshire Naturalist for May is remarkably full of valuable local records in various branches of natural history.

Naturalist

In Memoriam.

F. FIELDER WALTON, F.G.S.
(1860—1925.)

MANY years ago, in 1888, following the example set by a number of enthusiastic geologists in Leeds, a meeting of Hull people interested took place, with the result that the Hull Geological Society was founded. Prominent among these founders was F. Fielder Walton, whose pamphlet on the



Geology of the District between Market Weighton and the Humber had been issued two years previously. From that time the band of geologists has kept together and substantially contributed to our knowledge of the geology and palæontology of the East Riding, and while younger men have joined their ranks, the death of Dr. Walton causes one of the most serious gaps in the membership.

Dr. Walton was a keen collector, and acquired a taste for antiquities from his father. He was a collector long before he took up geology as a scientific study. One of his early papers on the Gravels at Hessle was read before the Yorkshire Geological Society, and printed in its *Proceedings* for 1895.

The pages of *The Naturalist* contain several of his notes dealing with geological observations made on excursions of the Yorkshire Naturalists' Union, and on the Erratic Blocks of the Ridging. Dr. Walton was a prominent member of the Erratic Blocks Committee, and took his share in the preparation of the numerous reports on the boulders of the Ridging, which were published some years ago. Lately he has given his attention principally to the zonal fossils of the chalk and lias, and had read a number of papers on these subjects to the Hull Geological Society, and occasionally to the Leeds Society. He was the President of the Hull Society for the first ten years of its existence, and has been a familiar figure at field meetings in the Ridging, having interest equally in the work of the Yorkshire Geological Society and the Yorkshire Naturalists' Union. He became a Fellow of the Geological Society of London in 1888.

In recent years he devoted some time to the collection of Roman and Saxon pottery, etc., and obtained some fine examples, spending much time in their restoration. The doctor's collections, extensive and carefully arranged and labelled in cabinets, are remaining in the district, the more important specimens having been secured for the Hull Municipal Museum.

The first excursion of the Hull Geological Society thirty-five years ago was to Kelsey Hill, and was led by Dr. Walton, whose last paper read to this society dealt with *Corbicula fluminalis* and other fossils in the same gravels.

At one time Dr. Walton was a member of the Hull City Council, and for years he has been a prominent member of the Council of the Hull Literary and Philosophical Society. He leaves a widow, a son, and two daughters, to whom we extend our sympathy.—T.S.

—: o :—

Prof. Hickson illustrates the way in which a hydra secured and killed a tadpole, in *Nature*, No. 2899.

The first part of a new journal *Zeitschrift fur Geomorphologie* (Annals of Geomorphology) has been issued at Leipzig.

P. G. Ralfe contributes Manx Ornithological Notes; The Editor Reports on the Recovery of Marked Birds; and W. G. Watson gives Notes from Holy Island, to *British Birds* for June.

Lord Tavistock relinquishes the editorship of *The Avicultural Magazine* as his time is so greatly occupied in philanthropic work. His place has been taken by Mr. D. Seth-Smith, a former editor.

Dr. J. Davidson writes on 'Bean Aphis' in *The Journal of the Ministry of Agriculture* for June, his notes being illustrated by a diagram showing life cycles of the insect and the different forms it passes through.

Having the good fortune to receive an invitation from his sister to spend Easter at her Bournemouth house, Mr. C. Granville Clutterbuck, and his wife, were able to enjoy some pleasant trips to the New Forest and other good grounds in the near neighbourhood. He gives the entomological results thereof in *The Entomologist* for June.

CORRESPONDENCE.

Dear Sir,

I have read with considerable amusement your comments in *The Naturalist*, May, 1925, upon the report of the lecture given by the President of the Yorkshire Ramblers' Club (Mr. E. E. Roberts), before the Yorkshire Geological Society in Leeds, which appeared in *The Yorkshire Post* of April 6th.

As one who has made some slight study of Limestone areas and their peculiarities, during the last twenty years, and has also had experience of 'pot-holing' and cave *exploration* and *survey* during that period, I am rather at a loss to understand the attitude of mind which has prompted your remarks.

Having merely a reasonable 'working knowledge' of the English language, I am quite unable to find the difference between the sense in which Mr. Roberts has used the words 'exploration' and 'survey,' and the meanings of these words as set forth in any recognised standard dictionary.

Perhaps the mere 'exploration' of even one of the large Yorkshire pot-holes in either the company of Mr. Roberts or any other experienced pot-holer would open up to you a new and interesting source of interest and field of study. Of course this would only be possible if your interest in natural phenomena outweighed your distaste for a certain amount of personal discomfort, and you possessed the necessary 'capacity of resistance to claustrophobia,' thereby qualifying you to be numbered as one of the 'small and select body' of pot-holers.—J. FRED SEAMAN, Ben Rhydding.

The writer of the notes to which Mr. Seaman refers, had as his object the giving of information or instruction; as in Mr. Seaman's case this has failed, the writer is gratified to know that, instead, Mr. Seaman has had 'considerable amusement.' The writer studied pot-holes and caves long before 'the last twenty years,' and during the latter period has kept up his studies. Neither Mr. Roberts nor Mr. Seaman therefore are likely 'to open up a new source of interest and field of study.' What the writer complains of is the extraordinary belief which is apparent among most of the pot-holers that the success of their 'surveys' and 'explorations' depends upon the discomforts to which they are put, and the number of adjectives they can find describing these discomforts, in the press. An actual scientific survey or exploration should have some tangible result, and in the reports of pot-holing which have appeared in recent years not a single scientific fact previously unknown seems to have been produced, and certainly, in some instances, errors have been made, which prevent progress. It is not so long ago that a prominent pot-holer gave the results of his explorations at a meeting of a well-known Geological Society and made misuse of certain geological terms, and although University Professors, members of the Geological Survey, and others protested, the pot-holer still maintained that his interpretation was the correct one, and that everybody else was wrong.—ED.

—: o :—

Among the contents of the *Journal of the Imperial Fisheries Institute*, Tokyo, we notice 'Apparatus for maintaining a Series of Constant Temperatures,' by H. Seno and M. Tauti; 'The Effect of Continued Cold on the Viability of the Plerocercoid of *Dibothriocephalus latus* L.,' by H. Seno, M. Kitagawa and S. Iwamoto; and 'The Effects of Uranium irradiation on the early cleavage stages of oysters,' by A. Terao.

The Entomologist's Monthly Magazine for June contains the following notes of interest to our readers:—'Additions to the British Psocid Fauna,' by J. V. Pearman; '*Mystrophora intermedia* Klap., new to the British Fauna, and *Apatania muliebris* McLach., two species of Trichoptera from the Lake District,' by K. J. Morton; and 'The Coast Coleoptera of the British Isles: a Study in Insect Oecology,' by G. B. Walsh.

NORTHERN NEWS.

The Leeds Corporation has unanimously invited the British Association to visit Leeds in 1927.

No. 3 of the *Journal of the Manx Museum* has articles on Castle Rushen; The Manx Shearwater, and many other matters of interest to the Manx Museum people.

A dinner was recently given to Prof. A. C. Haddon on his seventieth birthday, and the eve of his retirement from the post of reader in anthropology and ethnology in the Cambridge University.

For the remarkably low price of one shilling the Trustees of the British Museum have issued a well illustrated 'Guide to the Fossil Plants in the Department of Geology and Palæontology. The Guide is written by H. Hamshaw Thomas and W. N. Edwards.

Miss D. A. E. Garrod considers that 'we find in this country a high-developed proto-Solutrean level of Font-Robert type, indications at Cresswell Crags and Ipswich of a typical Solutrean influence, and, so far, no trace whatever of the Upper Solutrean of Central France' (*Man*, June).

Three full columns in a Yorkshire paper recently are occupied by photographs of an apparently charming young lady 'being harnessed up prior to her descent of the cliffs' at Flamborough, though there is surely nothing either novel or wonderful in the performance? She was not nervous, she said, and thoroughly enjoyed her experience. She had one regret 'she was quite near to a nice clutch of seabirds' eggs,' but was unable to secure them. This seems a pity, as we should have loved to have seen another photograph of her with her hands holding a large clutch of eggs of the Guillemot!

Referring to the note on the Grey Squirrel at Jervaulx, which appeared in *The Naturalist* recently, the editor of the *Natural History Column* of the *Yorkshire Weekly Post* writes: 'We know of several localities where the native squirrel was once common, but is now never seen. The grey variety has not arrived there yet, but, no doubt, if it does, it will at once be held responsible for the disappearance of the red. It would be interesting to learn if any reliable naturalist has actually witnessed an attack by a grey squirrel upon a red. Judging from the constant repetition of the charge, one might imagine that such an incident was of the commonest occurrence.'

In connection with an appeal for a British Institute of Philosophical Studies, we learn that: 'If materialism in life and superficiality in thought are the sins that most easily beset our nation to-day, the task of the Institute should be of immense importance. Its purpose is to encourage, even to popularise in some degree, pure thought, the search for abstract truth and the application of philosophy to life in all its modern complications of religion, science, politics and industry. We trust that the philosophers who are willing to help will not be daunted by the general ignorance of philosophy among a people notoriously lacking in theoretic instincts; nor impatient of teaching us, as it were, in words of one syllable.'

We have previously referred to the fact that foreign publications frequently print scientific articles in English, and we are now pleased to find that *The New Phytologist*, issued on May 28th, has the following paper by Dr. H. Pfeiffer, of Bremen: 'Über die Wasserstoffionenkonzentration [H.] als Determinationsfaktor physiologischer Gewebebegehungen in der sekundären Rinder der Pflanzen.' W. Robyns, of Brussels, writes on 'The Geographical Distribution of the Genus *Sphaeranthus*'; D. R. Hoagland and A. R. Davis, of California, give 'Suggestions concerning the Absorption of Ions by the Plants'; W. B. Crow gives 'The Reproductive Differentiation of Colories in Chlarydomonadales'; and W. H. Pearsall and Alice M. Hanby write on 'The Variation of Leaf Form in *Potamogeton perfoliatus*'.

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The Manchester Guardian says:—"This is a readable, popular history from the New Stone Age to the fifteenth century, with chapters on the feudal system, on the numerous monasteries in the district, and on the daily life of monk and layman in the Middle Ages. In the period to which it relates the Riding was the scene of many foreign invasions and of much civil war, and the author's object has been to show the relation of the local history to that of the nation. The volume contains many illustrations, and the price is astonishingly low for so handsome a work."

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The Museums Hull;

and **T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,**
Technical College, Huddersfield,

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

G. T. PORRITT, F.L.S., F.E.S.

JOHN W. TAYLOR, M.Sc.

RILEY FORTUNE, F.Z.S.

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NOTES AND COMMENTS.

THE SERVICE OF NATURAL HISTORY.

Under the above title Dr. A. Meek has a paper in *The Durham University Journal* for March. Referring to the fisheries, the author states: 'We now depend in this country for our supplies of fish to the extent of some 90 per cent. on deep sea fishing, and seasons of scarcity give rise to alarm and foreboding. But we have been able to show that the seasons of scarcity are not a new feature, that fluctuations are the rule not the exception. The fluctuations are due to the operations of factors not yet well understood, but the demonstration of the fact of fluctuation is important, for it inspires the hope that the seasons of scarcity will be followed by seasons of plenty.'

RIVER POLLUTION AND FISH.

'But when the scarcity is a permanent one and shows undoubted signs of becoming intensified and progressive, then the cause must be sought, and if humanly possible, a remedy found and applied. Such is the case with regard to the migratory Salmonidæ of the Tyne, the Wear, and the Tees. The obvious cause of the decline is the pollution of the river in each case. The pollution is becoming worse from year to year, and it is very difficult to say how it can be abated. Some view the pollution of the Tyne, for example, with equanimity, saying if the pollution brings the river finally to an end as a salmon river it cannot be helped; the loss is not a great one compared with the cost of the remedy. But others think that steps should be taken to minimize the evil if only from an æsthetic point of view. All the more when they reflect that the Cullercoats and Shields fishermen have become expert in catching the royal fish with drift nets, and they do not like to contemplate a time when this side of their industry may come to an end. Such foresee, moreover, that the pollution will, in due course, become not merely a nuisance but a danger to public health, and desire, and fondly hope, that the remedy which will some day be given may not be too late so far as migratory fish are concerned.'

WILLS AND BEQUESTS.

We learn from *The Museums Journal* that: 'Dr. George Abbott, F.G.S., of Rusthall Park, Tunbridge Wells, one of the founders of the Tunbridge Wells Eye and Ear Hospital, and of the Technical Institute, a well-known geologist, and for some years Hon. Curator of the Tunbridge Wells Museum, who died on January 12th, aged eighty, left unsettled property of the gross value of £7776, with net personalty £603. He states in his will: "I did offer a considerable sum to the Town Council through the Museum Committee towards the

cost of a new Museum Building to be erected on land already bought for the purpose. The offer was declined and kept secret. Stinginess to my mind as regards education at the present time is very false economy—in fact, a penny wise and a pound foolish policy. Many Englishmen are still unaware how far we are behind Germany, America, and even Scotland educationally. Their attitude of mind, alas, is altogether wrong, not seeing its importance. This, I fear, they will discover when it is too late. It seems, as a friend has just written me, ‘we need a Society for the Education of Town Clerks and Town Councils to remedy this and prevent them any longer thinking only of saving the town’s coppers.’ Until then, I ask, why should anyone leave them any legacies? Why? Why?”

PRE-TERTIARY GEOLOGY OF MULL, LOCH ALINE AND OBAN.*

A full account of the Tertiary and Post-Tertiary Geology of Mull, Loch Aline and Oban was given in a recently published memoir, and the present memoir completes the description of the rocks of this region. The earlier chapters deal with the crystalline schists, and with the sedimentary and volcanic rocks of Lower Old Red Sandstone age, including the conspicuous conglomerates and lavas of the Oban district. The Ross of Mull granite, which is probably of the same age as the lavas, is discussed, and special attention given to the effects it has produced upon the neighbouring schists. An isolated patch of Carboniferous rocks at Inninmore Bay is described, and several chapters devoted to a detailed account of the extremely interesting and rich Mesozoic sequence exhibited in Mull and Morven. These Mesozoic rocks include representatives of the Trias, Rhaetic, Lias, Inferior Oolite, Greensand and Chalk. Particular interest attaches to the Rhaetic of western Mull, as strata of this age have not previously been recorded *in situ* in Scotland. The presence of Inferior Oolite in this district has also been hitherto overlooked, and stratigraphers will note the striking resemblance between the sequence in Mull and that in the Inferior Oolite of the classical English districts. The Memoir is illustrated by maps, sections, and photographs, contains 140 pages, and is sold at 4/6 net.

IDEAL AIM OF PHYSICAL SCIENCE.

Prof. E. W. Hobson delivered a lecture on this subject before the University of London recently, and it is now available in pamphlet form.† The Professor asks, ‘Are electrons and atomic nuclei more than parts of a temporary scaffolding, ultimately to disappear, of which there are so many examples

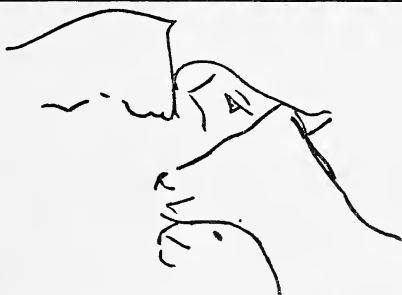
* *Memoir of the Geological Survey, Scotland.*

† 34 pages, 2/-. Cambridge University Press.

in the history of Physical Science, and of which the substantial ether is a striking example? Will the whole theories of chemical combinations and reactions, of electro-magnetism, and of gravitation, be one day welded together into a single deductive science such as the special department of geometry has already become? These are all questions which we may hope that our successors will elucidate.'

THE CRESSWELL ENGRAVINGS.

Writing in *Nature* (No. 2901), Mr. J. Wilfrid Jackson



records that before Mr. Armstrong read his paper it was pointed out to him that the markings on the three bone fragments were due to the action of roots. Mr. Jackson also pointed out that it was a mistake to outline the figures in Chinese white. On this question we wrote in reference to some alleged palæolithic scratches on flint nodules from Grimes Graves,* which had also been found by Mr. Armstrong. Sir Ray Lankester stated 'that a careful examination of the actual scratches on the flints did not seem to show that the animals were so cleverly drawn as represented in the photograph, which is a photograph of the Chinese white infillings

of the cracks, made presumably by the author for the better reproduction of the photographs.'

PLANT ROOTS OR PALÆOLITHIC MAN?

Mr. Jackson goes on to say: 'At a later date the bones were submitted to Sir William Boyd Dawkins and he brought them in to me for an opinion. I was able to convince him, by means of similarly marked bones in the Manchester Museum from excavations of various dates, that, beyond the two convergent incised lines on the "rhinoceros" piece, the markings on the three bone fragments were due entirely to root-action and were not of human origin. The most convincing piece of evidence is a human skull from a tumulus near Holyhead. The outer surface of this skull is scored in all directions by characteristic half-tunnels formed by the action of roots, and it is quite easy by following certain of the grooves to make animal figures of them. The accompanying photograph shows a small portion of this eroded surface, slightly above natural size. I cannot see the slightest difference between the markings on this skull and those on the three Cresswell bones. The misinterpretation placed upon the markings on the latter mars what is otherwise an important piece of work.'

THE HYDE PARK ATROCITY.

It is not always that we agree with *The Daily Mail*, but we must say we have a little sympathy with the following note which recently appeared therein:—'The new memorial to W. H. Hudson in Hyde Park, carved by Mr. Epstein, is a conspicuous example of the modern cult of ugliness. It is unfortunate that so many of our "highbrows" seem to imagine that art is only good when it is ugly. Their revolt against prettiness has developed into a revolt against beauty, and they appear to derive a sense of superiority from shocking the public taste. This is a bad form of intellectual snobbery. The public may not understand the whole meaning of a great work of art, but they understand quite enough to know what is beautiful and noble, and they are not to be deceived by the jargon of weary critics. The type of critic who can only listen to music which nobody else can stand, who can only look at pictures which are badly painted or incomprehensible, who can only read books which are revolting nonsense to the ordinary man, may consider himself remarkably clever, but is, in truth, remarkably stupid and conceited.'

'CREATING' BIRDS.

'When Mr. Epstein was asked what were the birds that surround his singularly plain female, he replied "Cannot I create birds as I see them?" If he sees them like that he had better consult an oculist. The Hudson memorial is a public possession, and public opinion ought not to have been outraged

by so grotesque a travesty. Instead of carving on classical lines, thus re-creating the beautiful spirit of Hudson's work, he has carved a heavy and shapeless mass of figures, which, to the average intelligence, is both ugly and meaningless. But one good purpose may yet be served by this fantastic carving. It will keep people away from the bird sanctuary where it is displayed, and thus give the birds the peace and solitude they desire.'

W. H. HUDSON.

Messrs. J. M. Dent & Sons, have issued No. 2 of their new publication, *The Bookmark*, which contains an interesting account of W. H. Hudson, by Viscountess Grey, of Fallodon. Accompanying this is a portrait of Hudson, a plan of the



Memorial in Hyde Park, and also a photograph of Epstein at work on the memorial, which we are permitted to reproduce.

HUDSON AND MARVELL.

Lady Grey concludes: 'All that is put together here I feel to be very fragmentary; very small for a man of such genius as Hudson. In thinking of him, those lines by Andrew Marvell come to mind, and if we take the presiding genius to which they allude as being Nature, then they not only recall Hudson's memory, but seem in some way to belong to him:

" 'Tis she that to these gardens gave
The wondrous beauty that they have.
She straightness on the wood bestows,
To her the meadow sweetness owes.
Nothing could make the river be
So crystal pure, but only she.
She, yet more pure, sweet, straight and fair
Than gardens, woods, meads, rivers are.' "

SCALES AND GROWTH OF HERRINGS.*

This paper deals with the value of scales as an aid to herring investigations, and also contains a brief outline of some of the problems which need solution before different 'broods' of herring can be separated with certainty. The chief difficulties discussed are those presented by the first growth zone on the scale, which suggests the existence of fish whose lengths are 8, 10, and 12 cms. at the time they form the first winter ring on their scales. The period of growth of the English herring has been closely observed by making use of the difference in appearance of the edge of the scale at different times of the year, and the actual calculated growth has been worked out for the four-year-old fish of 1924.

NORTHERN NATURALISTS' UNION.

We learn from *The Vasculum* for April that 'the Union having been in existence for the greater part of a year, and having proved its value, the provisional committee decided that it was time to complete the organization, and the first annual meeting was held in the new Science Laboratories, Durham, on Saturday, January 31st. On arrival, the party (over 60 strong) was met by Professor Irvine Masson and Dr. B. Millard Griffiths, who conducted it over the building. The laboratories are a valuable addition to the resources of the North-east, for they are very well planned and fitted, and although it seems likely that they soon will be overflowing with students, there is ample room for enlargement. There is much to be said in favour of small towns as seats of Universities, and one is disposed to envy the student who will work in these buildings, especially as one knows how favoured he will be in the matter of his professors and lecturers. At the meeting which followed the tour of inspection, Professor Irvine Masson formally welcomed the Union, expressing his hope that this was but the first of a series of visits, and that they might prove beneficial alike to the University and the Union.'

OFFICERS FOR 1925.

'The election of officers for the year came next, and resulted as follows: President, the Hon. Lady Parsons; Vice-Presidents, Mrs. T. E. Hodgkin (Stocksfield), Mr. W. Dixon (Rowland's Gill), Dr. B. M. Griffiths (Durham), Dr. J. W. H. Harrison (Birtley), Mr. R. Luck (Darlington), Mr. W. A. Smallcombe (Sunderland); Hon. Treasurer, Mr. C. P. Nicholson, Elmstead, Elms Road, Darlington; Hon. Secretary, Dr. F. C. Garrett,

* 'Investigations into the Age, Length, and Maturity of the Herrings of the Southern North Sea (Fisheries Investigations, Series II., Vol. VII., No. 8). Part 1.—Some Observations on the Scales and Growth of the English Herring.' By W. C. Hodgson, 36 pp., 5/- net.

West Croft, Hexham. These, together with one representative from each affiliated society, form the Council of the Union.'

THE STAMP OF AUTHORITY.

From a circular (No. 269) issued by the Geologists' Association, we gather that Prof. L. D. Stamp, of Rangoon, has sent a paper in which he states that 'From a consideration of the habits of present day representatives, an attempt is made to determine what factors most influenced the distribution in the past of the main groups of organisms. Examples are given to show that some palæontologists have ignored both habit and habitat. Before attempting correlation over wide areas the following must be considered:—(a) geography of the period; (b) uniformity or otherwise of physical conditions—for evidence of facies faunas; (c) possibility of non-sequences being explained in other ways than at present; (d) possibility of archaic faunas preserved as a result of geographical accidents; (e) the lessons to be learnt from the "Age and Area" hypothesis. Much greater co-operation between palæontologist and field worker is necessary. Each must recognise that the evidence of the other is to be carefully considered. Arm-chair and long-range palæontology must cease.' And that's that !

THE BRIDLINGTON MUSEUM.

Some enthusiastic antiquaries and naturalists are taking a keen interest in the collection of specimens now preserved in the Bayle Gate, Bridlington. They are endeavouring, as far as possible, to illustrate the history of Bridlington from the earliest times, and among many valuable objects on exhibition are some prehistoric remains of both the Stone and Bronze Ages, formerly in the possession of the late Thomas Boynton. There is also a fine series of mediæval antiquities, and 'bygones' of more recent times, in addition to which Messrs. Charlesworth, Lawson and others have been successful in gathering together a particularly valuable set of paintings, engravings, photographs, etc., of old Bridlington and district. In order to give more interest to the collection, the members of the Bridlington Augustinian Society have volunteered to be present at the Bayle Gate on Thursday and Saturday afternoons during the season, to welcome visitors and residents, and briefly to describe the pictures and antiquities. There is no charge made for admission, and we feel sure that the good work being done by the Bridlington Augustinians will be of benefit to the community, and that some day Bridlington will have its proper public museum duly cared for and paid by public funds. When that time arrives the Bayle Gate will do more than form a nucleus of the Bridlington Borough Museum.

THE YORKSHIRE CONCHOLOGICAL SOCIETY.

From Mr. J. Digby Firth's report for 1924 in *The Journal of Conchology* for July, we learn that 'Ten meetings have been held during the year. The five winter meetings were devoted to lectures and general exhibits. Prof. P. F. Kendall, M.Sc., F.R.S., contributed a paper on "The Conchology of the British Seas in the later Tertiary Period." Prof. W. Garstang, M.A., D.Sc., lectured on "The Larval Shells of Mollusca," and Mr. E. Percival, B.Sc. (of the Leeds University) gave an interesting account of "The Molluscan Foot," illustrated by a large number of specimens preserved in spirit. Among the exhibits may be mentioned a special display of *Helix caperata* from numerous localities, and general exhibits were shown at all ordinary meetings. The field meetings during the year have been fairly successful. The ecological investigation of the canal at Rodley has been further pursued, and several visits have been made to various localities in the neighbourhood. The Society regrets having to record the retirement from the position of Hon. Secretary of Mr. Fred Booth, who has so well and faithfully served the Branch throughout a period of over 20 years. The good wishes of the Society go with him to his new home in Queensland. At the March meeting held in Leeds Mr. Booth was presented with a purse wherewith to purchase a Colonial outfit. In making the presentation Mr. J. W. Taylor, M.Sc., referred to the valuable services rendered by Mr. Booth, not only to the Society, but to the Science of Conchology in general. He has been elected an Hon. Life Member of the Branch. It has been decided to change the name from "Leeds Conchological Club" to "The Yorkshire Conchological Society." Mr. F. Rhodes, of Bradford, is our President.'

ORIGIN OF THE CRUSTACEAN CARAPACE.

At a recent meeting of the Linnean Society, Prof. W. Garstang spoke "On the Origin of the Crustacean Carapace." 'The cephalic shield, or carapace, of Crustacea presents serious difficulties to the evolutionist on any theory of its origin in the adult phase. These difficulties disappear, and much new light is thrown on Crustacean phylogeny, when it is regarded as having arisen as a larval organ, in response to larval needs. Its retention, or not, in the adult is then seen to be a function of the duration of the pelagic larval phase, and of the adaptability of such an organ, originally subservient to flotation, to other purposes under the conditions of adult life. It is assumed that the proximate ancestors of Crustacea, prior to the development of a cephalic shield, were essentially Trilobites of lower Cambrian type, and that the ancestral mode of development, like that of the *Protaspis* larva of

Trilobites, was direct, the larva being discoidal and fitted only for flotation. It follows that the so-called "typical" Nauplii of Copepoda etc., with powerful rowing antennæ, are less primitive than the discoidal small-limbed Nauplii of *Limnetis* and Cirripedia. The caudal spine of the latter, though in itself not primitive, marks the dependence of the larva on passive flotation contrivances.'

EVOLUTION OF CRUSTACEA.

'On the development of post-cephalic segments in these larvæ, the trunk-rudiment sinks below the plane of the head, and the head *repairs the breach in its suspensory disk by an outgrowth from behind*. This is claimed to have been the origin of the carapace—a larval adaptation to lengthen the pelagic phase. But specialisation of anterior appendages for rowing then ensued, and the float, whose first function was to increase friction, was turned into a boat whose object was to diminish friction. Cirripede and Malacostracan life-histories clearly tell this tale. Finally, on the larvæ sinking to the bottom, the carapace, as a result of its successive adaptations to pelagic conditions, was a structure big enough to be made use of for a variety of modes of adult life. Thus the evolution of Crustacea, as a whole, may be summed up as the conversion, in spite of many backslidings, of homomeristic, crawling Trilobites into semi-pelagic heteromeristic Shrimps; and larval adaptations have played the chief part in this transformation.

YORKSHIRE CARBONIFEROUS ROCKS.

At a recent meeting of the Geological Society of London, Mr. Donald Parkinson gave a paper on "'The Faunal Succession in the Carboniferous Limestone and Bowland Shales at Clitheroe and Pendle Hill.'" The rocks described form that portion of the south-eastern limb of the Clitheroe Anticline which is included between the Twiston and Clitheroe Faults, along with most of the scarp-face of Pendle Hill. The succession is as follows:—

Strata.	Zones and Sub-zones.	Approximate thickness in feet.
PENDLE GRIT.		
BOWLAND SHALES.	{ <i>Homoceras leion</i> (?)	50
	{ <i>Eumorphoceras pseudobilingue</i>	400
	{ <i>Goniatites spirale</i> P ₂	250
	{ <i>Goniatites sphaericostriatus</i> P ₁	600
PENDLESIDE LIMESTONE SERIES.	{ <i>Emmonsia parasitica</i> D ₂	40
	{ <i>Lithostrotion arachnoideum</i> D ₂	260
	{ <i>Beyrichoceras hodderence</i> D ₁	300
WORSTON SHALE SERIES.	<i>Prolecanites compressus</i> D ₁ ?	1100-1600
CLITHEROE LIMESTONE.	{ Salt Hill Knoll Series. <i>Pustula ovalis</i> S.	900-1400
	{ Coplow Knoll Series. <i>Spirifer subcinctus</i> C.	400
	{ Chatburn Limestone. <i>Pustula nodosa</i> Z-C ₁ ...	700+
		Base not seen.

ORIGIN OF REEF KNOLLS.

The lowest beds appear to be of Z age, but the junction of Z and C is an uncertain horizon. The Coplow Knoll Series is of similar facies to the C zone of County Clare, and the Waulsortian of Belgium. The knoll-limestones pass laterally into shales and crinoidal limestones. The Salt Hill Series, of S age, shows similar lateral variations. The knolls of this group are finely developed, and one (Worsaw) is about 1400 feet thick. The Worston Shale Series, of probable D₁ age, includes most of the "Shales-with-Limestones" of the Geological Survey maps. It is overlain by the *hodderense* goniatite-band, which forms a constant feature along the foot of Pendle Hill. The Pendleside Limestone proper contains an Upper D coral-brachiopod fauna, with *Goniatites crenistria* at the top. The Lower Bowland Shales with *G. sphaericostriatus* and *Posidonomya becheri* succeed, and these beds are correlated with P₁ of Loughshinny and with the Lower Yoredale Series. It appears probable that the beds usually referred to Lower P are in reality of D₂ age. The *Spirale* Zone is correlated with P₂ of Loughshinny. The *Pseudobilingue* Zone terminates below the Pendle Grit, where another goniatite (possibly *H. leion*) appears, and forms a continuous horizon just below the grit. It is suggested that the base of the Upper Carboniferous should be drawn here. The nature of the junction of the Worston Shales with the knoll-limestone is discussed. The shales appear to have been deposited on a very uneven sea-floor, the irregularities being due to the mode of accumulation of the limestones, and not to interformational uplift and erosion. This, and other evidence, lends support to Tiddeman's theory of the origin of reef-knolls.

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REVIEWS AND BOOK NOTICES.

A Gentleman Adventurer, by Marian Keith. London: Hodder & Stoughton, 301 pp., 7s. 6d. net. A story of love and adventure centred round the Hudson Bay Company; it deals with the fur trade and trapping, and the inner workings of the Company. It is a book to suit all tastes and lays particular stress on the way in which promotion was gained in the Company's service by a series of marriages and inter-marriages.

The Selborne Nature Student's Note and Observation Book, 3rd Edition. London: J. Bale, Sons and Danielson, 30 pp., 1s. net. This is a monthly calendar consisting of 30 pages of notes with ruled interleaves for observation notes. For each month is given a list of specimens to observe, and notes on the weather, e.g., for March and April 'wild flowers, garden flowers, trees and shrubs, insects, birds, animal life, weather.' Under 'animal life' for March we note that 'field mice, bats and squirrels awake from their winter quarters, and tadpoles appear,' and for April 'the otter is busy fishing, rabbits frisk, toads awake.' For the remaining ten months 'animal life' disappears from the lists, and 'insects' for the months of September, November

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and December. This classification seems to suggest that insects and birds belong to something other than 'animal life.' There is a set of notes on the barometer and weather guide, and the work concludes with the following lists: typical grasses, mosses and hepatics, poisonous plants, fungi, forest trees, summer migrants, fresh-water algæ, sea weeds. The comments are uneven, and seem to appear at random without special significance. In the main the lists consist of names only. There are two illustrations, one of these a frontispiece, 'The Home of the Hyacinth.' If this book induces students to look out for and make observations and notes on the species mentioned, it will serve a useful purpose.

An Introduction to Physical Geology, by **William J. Miller**. London: Chapman & Hall, Ltd., xvi.+435 pp., 13s. 6d. net. The Professor of Geology in the University of California, by the aid of a wonderful series (over 350) of photographs, views, and diagrams, has gathered together a number of chapters dealing with various aspects of Physical Geology, with special reference to North America. His fifteen chapters are devoted to Introduction; Minerals; Rocks; Weathering; Earth's Crust; The Work of Streams; Glaciers; Wind; The Sea; Volcanoes; Underground Waters; Lakes, etc.; and Economic Geology. His narrative is made particularly fascinating by a clever selection of illustrations.

An Introduction to Regional Surveys, by **S. Branford and A. Farquharson**. London: The Leplay House Press, vii.+49 pp., 2s. 6d. net. Nowadays we are hearing much of Regional Surveys, and of the wonderful amount of information which can be gathered together on a series of maps dealing with any particular area. In the pamphlet before us the authors have gathered together a valuable series of facts, well illustrated by photographs, diagrams and sections which should be of service to those interested in the subject.

The Geological Survey seems to have developed a keen desire to bring its various Memoirs up to date, and is turning them out with commendable rapidity. **Mr. H. J. Osborne White** describes **The Geology of the Country around Marlborough** (v.+112 pp., 2s. 6d. net); the frontispiece of which is a view of The Devil's Den, Sarsen Stones, near Fyfield. There are descriptions of various beds between the Kellaways and Superficial Deposits, with lists of ammonites, survey photographs, etc. **R. W. Pocock** and **D. A. Wray** describe **The Geology of the Country around Wem** (vi.+125 pp., 3s. net), by the aid of numerous maps, photographs and sections. Here again various beds between the Pre-Cambrian and recent are described, and there are valuable notes on Economics. **C. E. N. Bromehead** and **H. G. Dines** describe **The Geology of North London** (vii.+63 pp., 1s. 6d. net) in a particularly racy and readable manner, and there is no doubt that, as with the preceding Memoirs, there will be a good sale for these publications. All three are well and neatly printed and bound, though there is the same delightful variety of paper upon which the articles are printed, which still shows that we are dealing with British Geological Survey publications.

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We learn from *The Yorkshire Telegraph and Star* that 'miners who are prospecting for gold and silver, near Sisoguichie Chihuahua (says a Mexico message), have discovered giant human skeletons measuring 10 and 12 feet high.' Now Ipswich!

In reviewing Burkitt's 'Prehistory' in *Man*, 'H.J.E.P.' writes that the author 'advances further evidence for the multiglacial view, though, *strangely enough*, he omits any reference to the most important paper on the subject, that published in our journal by Prof. Boswell and Mr. Reid Moir.' As already stated in these columns, Mr. Burkitt has earned our gratitude for omitting certain 'contributions to science,' and we gave him credit for having done so desigedly.

YEOVILIAN AMMONITES IN THE INLAND AREA OF THE YORKSHIRE MOORS.

W. E. F. MACMILLAN.

DURING my holidays in Yorkshire in the last two years I found a number of ammonite fragments at three spots in the Danby district, all about the line of the Dogger as shown in the maps of the Geological Survey, viz., (i.) high up in Danbydale, at 1000-1050 O.D., on the Upper Lias shale slopes; (ii.) in Little Fryup Head, at 1040 O.D. in a quarry; (iii.) at Great Fryup Head, on shale slopes underlying the Dogger escarpment of Yew Grain Scar (Fox Strangways, *Jurassic Rocks*, Vol. I., p. 169), at 1000 O.D.

I have now shown these specimens to Dr. Spath at the British Museum, and, though they are too imperfect for specific identification, they can, in his opinion, be definitely assigned to the following Yeovilian zones and groups.

Dispansum Zone.

Phlyseogrammoceras (Great Fryup and Little Fryup).

Hudlestonia (Little Fryup). (A *Lioceras*-like fragment of body chamber from Little Fryup should probably be classed as *Hudlestonia*).

Striatulum Zone.

Grammoceras (Great Fryup and Danbydale).

Unfortunately, with the exception of one specimen of *Hudlestonia* low down in the Little Fryup quarry, none of the specimens was found precisely in place. None, however, can have been far from its place of origin, for the remaining Little Fryup specimens were in a heap of road metal cut from the face of the quarry, and those from Great Fryup and Danbydale can only have come from the Upper Lias shale on the slopes of which they were found (their lithological appearance suggests this), or from strata immediately above, all this ground being in the heart of the driftless area.

Both the fragments of ferruginous sandstone containing *Phlyseogrammoceras* include several specimens crowded closely together, and from this fact, as well as the character of preservation of the fossils, Dr. Spath is clear that they are embedded in the rocks of their own zone, and are not derived fossils. He is of the same opinion with regard to the specimens of *Hudlestonia* and *Grammoceras*.

There would appear, therefore, to be a *prima facie* case for assuming the existence in this area of Yeovilian beds, some trace of which is indeed indicated by Fox-Strangways (*op. cit.* Vol. I., p. 152), in the adjoining dale, Glaisdale. The matter, of course, needs working out in more detail, and I hope to devote more time to it during my holiday this year.

YORKSHIRE HEMIPTERA IN 1924.

JAMES M. BROWN, B.Sc., F.L.S., F.E.S.

THOUGH the past season was not a very satisfactory one for entomologists, we are able to add 29 species to the County list of Hemiptera. This is largely due to two papers which have appeared since the report for 1923 was published (*The Naturalist*, April, 1924), viz.: 'New Yorkshire Records of Hemiptera,' by G. B. Walsh (*The Naturalist*, July, 1924), and 'Hemiptera from North-east Yorkshire,' by the present recorder (*The Naturalist*, April, 1925). In these two papers, 19 species of Heteroptera and 9 species of Homoptera are given as new county records, mainly from V.C. 62 and 61. These are not repeated here, but 4 additional Homoptera can now be included, bringing the total fresh records for the season to the figure mentioned above.

I am indebted to the following for supplying me with records, or specimens for identification: Rev. C. Ash, Messrs. E. G. Bayford, W. J. Fordham, W. D. Hincks, M. L. Thompson, and G. B. Walsh. Hemiptera were collected at two of the excursions of the Yorkshire Naturalists' Union at Croft by Mr. Thompson, and at Edlington by myself.

†=New to the County. *=New to the Vice-county.

HETEROPTERA.

- Stygnocoris fuliginosus* Geoff. Flixton Sand-pit and Forge Valley, G.B.W.
- Gastrodes ferrugineus* L. Skipwith, C.A. To this, the only previously recorded locality, can now be added Hornby, M.L.T., 62*.
- Nabis major* Costa. Flixton and Forge Valley, G.B.W.
- N. fesus* L. Forge Valley, G.B.W.
- N. rugosus* L. Edlington Woods, J.M.B.
- Anthocoris gallarum-ulmi* DeG. On elms, but not very plentiful, Rivelin Valley, near Sheffield, J.M.B., 63*.
- Acompocoris pygmaeus* Fall. Kildale, M.L.T.
- Pithanus mærkeli* H.S. Hornby, M.L.T.
- Phytocoris populi* L. Barnsley, E.G.B.
- Calocoris alpestris* Mey. Edlington Woods, J.M.B. This species seems fairly well distributed in Yorkshire.
- C. roseo-maculatus* DeG. Allerthorpe, on thistles, W.J.F. This makes the third locality for this fine species, 61*.
- Lygus contaminatus* Fall. Skipwith, C.A. Rivelin Valley, J.M.B.
- L. spinolæ* Mey. Ellerburn, G.B.W. This is the second locality noted for this rather rare species which was obtained last year at Sandsend.
- L. cervinus* H.S. Raincliffe Woods, G.B.W.
- L. rubricatus* Fall. On conifers, Hornby, M.L.T. Raincliffe Woods, G.B.W.
- Camptozymum pinastri* Fall. On conifers, Skipwith, C.A. So far this has been the only locality recorded for this species, but I have taken it in considerable numbers this year (1925) near Sheffield.
- Miris (Leptopterna) dolabratus* L. Hornby, M.L.T. Also in numbers among long, coarse grass, Oughtibridge, J.M.B. This species seems much less common with us than *M. ferrugatus*.

- Monalocoris filicis* L. Hornby, M.L.T.
Dicyphus epilobii Reut. Edlington Woods, J.M.B.
D. stachydis Reut. Edlington Woods and Rivelin, J.M.B.
Cyrtorrhinus caricis Fall. On rushes, Rivelin, J.M.B.
Malacocoris chlorizans Panz. On hazel, Rivelin, J.M.B.
Harpocera thoracica Fall. Rycroft Glen, near Sheffield, on the county borders, J.M.B. This seems a local species, and emerges earlier than most Capsids.
Psallus betuleti Fall. Skipwith, C.A. Rivelin, J.M.B.
P. lepidus var. *minor* Fieb. Forge Valley, G.B.W., 62*.
P. roseus F. On sallows, Rivelin, J.M.B.
Asciodema obsoletum Fieb. On gorse, Rivelin, J.M.B.
Gerris gibbifer Schum. Shadwell, W.D.H.
Corixa striata L. E. Ayton, G.B.W., 62*.
C. præusta Fieb. Greatham, M.L.T., 65*.

HOMOPTERA.

- Philænus exclamationis* Thum. On healthy pastures, Rivelin Valley, J.M.B.
Tettigonia viridis L. Adel, W.D.H.
† *Idiocerus elegans* Flor. Hayburn Wyke, G.B.W.
I. populi L. Millhouses, Sheffield, J.M.B.
I. albicans Kbm. Hayburn Wyke, G.B.W.
Agallia venosa Fall. Rivelin, J.M.B.
A. brachyptera Boh. E. Ayton, G.B.W. This is the third Yorkshire locality for this curious little creature, it having been taken at Scarborough and Bridlington.
Athysanus sordidus Zett. Silpho Moor, G.B.W. Edlington Woods, J.M.B.
A. brevipennis Kbm. Very common among grass in spring, Ecclesall Woods, J.M.B.
A. plebejus Fall. Rivelin, J.M.B.
Deltocephalus flori Fieb. Rivelin, J.M.B.
† *D. punctum* Flor. Occurs in similar places to *Ph. exclamationis*, and frequently with it, Rivelin Valley, J.M.B.
D. thenii Edw. Very common, Rivelin, J.M.B.
Chlorita flavescens Fab. Forge Valley, G.B.W., 62*.
Typhlocyba sexpunctata Fieb. Ecclesall Woods, J.M.B., 63*.
T. lethierryi Edw. Edlington Woods, J.M.B.
T. tenerrima H.S. Harwood Dale, G.B.W.
T. quercus Fab. On brambles, Harwood Dale, G.B.W. On oaks, Rivelin, J.M.B.
Zygina coryli Toll. Rivelin, J.M.B.
Z. neglecta Edw. Edlington Woods, J.M.B.
Cixius brachycranus Scott. On elm, Rivelin, J.M.B.
Delphax pellucida Fab. In long grass, Edlington Woods, J.M.B.
D. difficilis Edw. With the last, Edlington Woods, J.M.B.
D. discolor Boh. Edlington Woods, J.M.B.
† *D. forcipata* Boh. Among grass, Ecclesall Woods, J.M.B.
Stiroma affinis Fieb. Edlington Woods, J.M.B., 63*.
† *S. albomarginatus* Curt. Obtained by sweeping among grass, Ecclesall Woods, J.M.B.
Aphalara exilis W. and M. Humber Bank, Hull, G.B.W., 61*.
Arytæna genistæ Latr. Rivelin Valley, J.M.B.
Trioxa urticæ L. Harwood Dale, G.B.W. Rivelin, J.M.B.

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The Lancashire and Cheshire Naturalist for July has papers on local Mosses, Lichens, Arachnida, Plant Galls, The Pear Gnat Midge in Lancashire, Some Cheshire Plants, and on *Rhyncodemus britannicus*.

YORKSHIRE NATURALISTS AT HORBURY.

W. H. PEARSALL, D.SC., F.L.S., AND F. A. MASON, F.R.M.S.

ON June 25th the Yorkshire Naturalists' Union held its three hundred and twenty-first meeting in the Coxley Valley, near Horbury, headquarters being in Middlestown. The long continued dry weather handicapped work in many sections. To those who had not visited this area before, the woods, practically undisturbed, came as a welcome surprise, and an enjoyable afternoon was spent in them. At the evening meeting, at which the President, Professor J. H. Priestley, D.S.O., presided, the thanks of the meeting were expressed to Messrs. J. Hooper, W. Rushforth and C. A. Cheetham for their assistance in leading and arranging the meeting, and to Mr. J. W. Balden for permission to visit the woods.

BOTANY (W. H. Pearsall) :—While the woods were as a whole of the usual dry oak type, with *Pteridium* and *Deschampsia flexuosa* on the ground, there were also interesting and unusual sandy alluvia along the stream side. On these the oak was replaced by elm, ash and sycamore, the ground flora becoming one chiefly of *Milium effusum*, *Deschampsia caespitosa*, *Holcus mollis* and *Brachypodium sylvaticum*. The trees were very tall, and saplings seemed to have considerable difficulty in piercing the canopy, and large numbers of dead trees resulted, chiefly of sycamore. One elder had reached a height of about thirty feet.

The upper of two dams lower down the valley shewed very clearly the effects of silt deposition on the marsh vegetation. A bank of silt near the stream was dominated by *Epilobium hirsutum* and *Salix fragilis*, while further away from the stream and silt, the peaty mud was covered by a profusion of *Equisetum limosum*. Mr. Hooper informed us that this marsh was open water, carrying boats, fifteen years ago.

No flowering plants of note were seen beyond those contained in Messrs. Wattam's and Rushforth's lists. *Potamogeton pusillus* was searched for but not seen. Records of this plant are worth re-examining, as it has often been confused with *P. panormitanus*, which is now known to occur in Britain. A few trees of *Quercus Robur* were seen—these probably having been planted.

BRYOPHYTES (W. H. Burrell) :—The two most interesting Bryophytes seen were *Calypogeia arguta*, in profusion on soil, and *Orthodontium gracile* var. *heterocarpum*, in somewhat unusual surroundings, on a willow tree. Here is a task for a local botanist, to link up this outlying station with the moors at Penistone and Holmbridge, where *Orthodontium* is plentiful; is it a casual at Coxley, or are there heathy places close at hand where it might be expected to flourish?

With these two exceptions the mosses and liverworts noted were such as are generally distributed: *Fontinalis antipyretica*, *Eurhynchium rusciforme*, *Hypnum riparium* in the stream, *Tortula muralis*, *Funaria hygrometrica*, *Bryum caespitium* on walls; *Aulacomnium androgynum* on rock ledges in the quarry; *Mnium punctatum*, *Amblystegium filicinum*, *Hypnum cuspidatum*, *Aneura pinguis*, *Pellia epiphylla*, *Conocephalum concium*, *Chiloscyphus polyanthus* in the wet ground; *Tetraphis pellucida*, *Catharina undulata*, *Ceratodon purpureus*, *Dicranella heteromalla*, *Fissidens bryoides*, *Mnium hornum*, *M. serratum*, *Brachythecium rutabulum*, *Eurhynchium praelongum*, *E. Swartzii*, *Plagiothecium elegans*, *P. sylvaticum*, *Hypnum cupressiforme*, *Lophocolea bidentata*, *L. heterophylla*, *Calypogeia Trichomanis*, *Cephalozia bicuspidata* in the woodlands.

DIPTERA (C. A. Cheetham) :—Probably the most striking insect was the silvery dolichopod *Argyra leucocephala*. This flitted about in the sunshine all the length of the streamside. This group gave as additions to our list *Porphyrus spinicoxa*, *Xiphandrium monotrichum*; others belonging to this group were *X. appendiculatum*, *Psilopus platypterus*,

Dolichopus pennatus, *popularis*, *plumipes*, *griseipennis*, *Gymnopternus cupreus* and *Campsicnemus curvipes*. The small but beautiful *Callimya speciosa* came into the net, and amongst the Hover flies were *Chrysogaster hirtella*, *Chilosia variabilis*, *Platychirus peltatus*, *immarginatus*, *manicatus*, *Syrphus balteatus*, *Ascia podagrica*, *Rhingia campestris*, *Volucella pellucens*, *Eristalis pertinax*, *Helophilus pendulus* and *Xylota segnis*. Among the Empids *Euthyneura Gyllenhali* is an addition, but this had been taken at Pateley Bridge last year by Mr. F. W. Edwards and not previously recorded. Other Empids are *Hybos femoratus*, *culiciformis*, *Empis grisea*, *stercorarea*, *tessellata*, *trigramma*, *Hilara chorica*, *quadrivittata*, *Edalea flavipes*, *Hemerodromia praecatoria*, *Ardoptera irrorata*, *Trichopeza longicornis*, *Tachypeza nubilula*. In this Brachycera section *Beris geniculata* was plentiful, and a few *B. Morrisii*, this being another addition to the list; *Chrysopilus cristatus*, *Dioctria rufipes* and a solitary cleg *Hæmatopota crassicornis*.

The most interesting daddy-long-legs was *Tipula irrorata*, of which half a dozen examples were taken; others were *oleracea*, *fulvipennis*, *scripta*, *unca*, *varicornis*, *lunata*, *lateralis*, *alpinum*. *Pachyrhina quadrifaria lineata*, *Dolichopeza sylvicola*, *Pedicia rivosia*, *Dicranota pavida*, *Tricyphona littoralis*, *Limnophila lucorum*, *nemoralis*, *ochracea*, *Limnobia tripunctata*, *flavipes*, *nubeculosa*, this last coming in clouds from all the clefts of the rocks in the quarries. *Ptychoptera albimana*, *paludosa*, *lacustris*. The only mosquitoes were *Ochlerotatus nemorosus* and *Culex pipiens* and the fungus gnats *Macrocera centralis*, *vittata*, *Mycomyia marginata*. The Anthomyids noted were *Phaonia pallida*, *Alleeostylus diaphanus*, *Anthomyia pluvialis*, *Cænosiopsis sexnotata*.

Among the *Acalypterates* an addition is *Chætomus flavotestaceus*. We have *Leria flavotestaceus* previously recorded, but Czerny, in his Monograph of the Helomyziden (1924), makes our previously recorded insect into *Chætomus confusus*, and the Coxley insect *C. flavotestaceus*. *Pallopia saltuum*, *triaculata*, *umbellatarum*, *Peplomyza Wiedemanni* (*litura*), *Sapromyza inusta*, *præusta*, *Psila pallida*, *Chlorops speciosa*, *Nemopoda cylindrica*, *Sepsis violacea*; the reed borers *Tetanocera corylella*, *lævifrons*, *elata*, *Limnia unguicornis*, and the gall flies *Acidia cognata* and *Spilograpta Zoe*.

It is evident from this list, collected in the short time allotted to the excursion, that the district would richly repay anyone working it regularly for diptera, there is plenty of variety of soil, plants, etc., to provide the necessary habitats and woodland to give shelter to the insects.

LEPIDOPTERA (J. Hooper):—Lepidoptera were scarce at this meeting, and only a few common species were taken, e.g., *M. montanata*, *M. hastata*, *H. impluviata*, and *E. vulgata*.

MOLLUSCA (Greevz Fysher):—At Horbury Bridge on the 25th June the following Molluscs were observed: they have been verified by Mr. J. W. Taylor, M.Sc. Upper pond Coxley, *Planorbis marginatus*. Lower pond, Coxley, *Limnæa peregra*. Stream from pond, *Paludetrina jenkinsi*. Coxley Wood, *Hyalinia cellatia*, *H. alliaria*, *H. nitidulus*, *Helix hispida*, *H. striolata*. Thornhill Skating Pond, *L. stagnalis*, *P. corneus*.

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Nature, No. 2906, has a special supplement devoted to 'Evolution and Intellectual Freedom,' with contributions by a whole army of scientific men.

The Vasculum for July promises more pages each part for the future. There are several papers and reports dealing with the fauna and flora of bogs; A. D. Peacock writes on 'The History and Geography in outline of the Flora and Fauna of Northumberland and Durham'; and J. A. Smythe on 'Minerals of the North Country.'

LICHEN FLORA OF THE INGLETON DISTRICT.

D. A. JONES, M.Sc.

THROUGH the kindness of Mr. W. H. Burrell (Chairman) and Mr. F. E. Milsom, B.Sc. (Secretary), the writer was invited to meet the members of the Yorkshire Naturalists' Union at their meeting at Ingleton during Easter week. The following list of lichens was compiled during excursions arranged by the above enthusiastic group of cryptogamic botanists, and will probably give some idea of the distribution of these interesting plants in the district. That the rupestral lichens were better represented than those growing on trees is due, no doubt, to the presence of smoke which affected the latter to a greater extent. The list, of course, is by no means complete.

Of the corticolous lichens, *Lecanora varia* and *L. conizaea* were abundant everywhere. *Parmelia physodes*, *P. sulcata*, *P. saxatilis* and *P. fuliginosa* var. *latevirens* were well distributed. *Pertusaria pertusa* and *P. faginea* were less common, whereas *Opegrapha atra*, *O. saxicola* Ach., and *Graphis elegans* were decidedly of rare occurrence, and as far as it was found, the only species belonging to the family Graphidaceæ. *Evernia prunastri* struggled to exist on some of the trees, while the Ramalina group was not represented at all. *Pyrenula nitida* was not met with.

The calcareous rocks were fairly rich in lichens. The Yoredale limestone at the summit of Ingleborough yielded a fair number of interesting plants. *Solorina saccata*, with its beautifully bright green thallus when in moist condition, was not uncommon, and occasionally the rarer *S. spongiosa* grew on ledges covered with soil. *Placynthium nigrum*, *Gyalecta cupularis* and *Crocynia lanuginosa* occurred frequently, and *Dermatocarpon lachneum* and *Lecidea lurida* were found in a few places. The lichens forming pits (*foveolæ*) in the limestone were well represented. *Lecidea immersa*, *Verrucaria rupestris* and *V. calciseda*, as well as *Staurothele rupifraga*, were noticed. No doubt many other species occurred, but no time could be spared for closer examination of these minute species. *Lecanora cartilaginea* A.L. sm. (*L. crassa* Ach.), found in such great abundance on the limestone at Minera, Wrexham, was conspicuous by its rarity.

The limestone walls at the foot of Ingleborough and in the vicinity of Beezley Farm presented a rich lichen flora. Among the commoner plants noticed were *Placynthium nigrum*, *Xanthoria parietina*, *Placodium callopismum*, *P. flavescens*, *P. rupestre* var. *calvum*, *Physcia hispida*, *Lecanora calcarea* with its varieties *contorta* and *Hoffmanni*, *Rhizocarpon calcareum* and *Acrocordia epipolia*.

The large boulders of Millstone Grit on the N.W. side of Ingleborough were rather barren, *Parmelia saxatilis* and *P. omphalodes*, *Cladonia foliacea* and *C. furcata*, and the ubiquitous *Lecidea contigua* only being observed. The boulders on the East side of the mountain belonging to the same series of rocks were more productive. *Evernia furfuracea*, *Lecanora polytropha*, *Gyrophora polyphylla*, *Stereocaulon denudatum* var. *pulvinatum*, *Lecidea contigua* and *L. confertula* were found sparingly.

The usual lichen flora of the Lower Silurian was fairly well represented. Some of the commoner *Parmeliae*, especially *P. physodes* and *P. saxatilis*, *Lecanora tartarea*, *L. cinerea*, *Acarospora furcata*, *Lecidea protrusa*, *L. confluens* and *L. contigua*, together with *Rhizocarpon geographicum* and *Rh. Oederi* were the characteristic plants of this formation.

On peat, *Lecidea granulosa*, *Cladonia Floerkeana* and *Cl. coccifera* were not uncommon.

On soil at Crina Bottom a fair amount of *Coriscium viride* was found by Miss Hilary. In a similar habitat on the road above Ingleton *Botrydina vulgaris* Breb. occurred. This is not uncommon in the glens that were visited.

The following complete the list of lichens and the localities where they were found :—

- Sphærophorus globosus* Wain. Below Beezley Falls.
S. fragilis Ach. About Thornton Force and Beezley Falls.
Collema pulposum Ach. Ingleborough, Ingleton and Clapdale.
C. granuliferum Nyl. Ingleborough.
Leptogium sinuatum Massal. Clapdale and Thornton Force.
L. lacerum S. F. Gray. Below Snow Falls.
 var. *pulvinatum* Koerb. Ingleborough.
Peltigera canina Willd. Swilla Glen and Clapdale.
P. rufescens Hoffm. Common.
 var. *prætexta* Nyl. In several places with type.
P. polydactyla Hoffm. Swilla Glen.
P. horizontalis Hoffm. Woods near Kingsdale Beck.
Lobaria scrobiculata DC. A small specimen on rocks below Beezley Falls.
Parmelia perlata Ach. Above Swilla Glen, Beezley Farm and Clapdale.
P. caperata Ach. Sparingly in several places.
P. scorteia Ach. In fine quantities on rocks at Thornton Force and on a tree near Beezley Farm.
P. saxatilis f. *panniformis* Cromb. and f. *furfuracea* Schaer. On trees and rocks with the type.
P. dubia Tayl. On trees below Swilla Glen and Beezley Falls ; also, near Beezley Farm.
P. lævigata Ach. On rocks below Beezley Falls.
P. conspersa Ach. Thornton Force and Pecca Falls.
P. omphalodes Ach. Millstone Grit, Ingleborough.
P. fuliginosa Nyl. In several places, but not so well distributed as the var. *latevirens* Nyl.
Cetraria glauca Ach. Occasionally on trees in the two glens and above Clapham.
 var. *fallax* Ach. Swilla Glen.
C. aculeata Fr. Not uncommon. f. *hispida* Cromb. Ingleborough.
Evernia furfuracea Mann. Below Ingleborough ; walls above Ingleton.

- Usnea florida* Web. Here and there in the glens, but poorly developed.
Alectoria jubata Ach. and var. *chalybeiformis* Th. Fr. Ingleborough.
Placodium callopismum Mer. Not infrequent on calcareous rocks and walls, and mortar in the district.
P. flavescens A. L. Sm. Not uncommon on limestone rocks and walls, and on mortar of walls in several places.
P. citrinum Anzi. Common on mortar of walls and sometimes on boulders.
P. aurantiacum var. *flavovirescens* Anzi. Fairly general on rocks and walls.
P. ferrugineum var. *festivum* A. L. Sm. Boulders in R. Greta.*
P. rupestre var. *calvum*. On calcareous rocks and walls, frequent.
P. xantholytnm Nyl. Clapdale, *vide* W. Watson.
Candelariella vitellina Müll.-Arg. Frequent on rocks and walls.
Physcia stellaris Nyl. Ingleton.
 and var. *aiopolia* Nyl. On trees near Beezley Farm.
P. hispidia Tuckerm. Generally distributed.
P. cæsia Nyl. Near Beezley Farm.
P. orbicularis var. *virella* Torre and Sarnth. On trees and walls, Ingleton, and near Beezley Farm.
Rinodina demissa Arn. Mortar of walls, Ingleton.
Lecanora muralis Schær. Near Beezley Farm.
L. subfusca var. *chlaronia* Ach. Swilla Glen and near Pecca Falls.
 var. *allophana* Ach. Near Pecca Falls.
L. campestris B. des Lesd. Ingleton and near Beezley Farm.
L. atra Ach. Rocks about R. Greta.
L. sordida Th. Fr. Lower part of R. Greta.
L. galactina Ach. Common on limestone rocks and walls.
 sub spec. *dispersa* Nyl. Ingleton.
L. polytropia Schaer. Ingleborough.
L. tartarea Ach. Occasionally on trees in the glens.
L. parella Ach. On rocks near Beezley Falls and Thornton Falls.
L. calcarea var. *contorta* Hepp. Calcareous scree, Ingleborough. Walls above Ingleton.
 var. *Hoffmanni* Sommerf. Walls above Ingleton; Ingleborough.
L. lacustris. Stones in R. Greta.
Acarospora fuscata Th. Fr. Slaty rocks about R. Greta.
A. smaragdula Massal. Ingleborough.
Hæmatomma ventosum Massal. Rocks near Pecca Falls.
Pertusaria lactea Nyl. Near Thornton Force.
P. dealbata Cromb. Thornton Force.
 and f. *corallina* Cromb. Thornton Force.
P. leioplaca Schaer. Hazel near R. Greta.
Thelotrema lepadinum Ach. Swilla Glen.
Phlyctis argena Koerb. In the two glens; rare.
Diploschistes scruposus Norm. Below Pecca Falls.
D. bryophilus Zahlb. Walls near Beezley Farm.
Baeomyces rufus D.C. In the two glens; Crina Bottom.
B. roseus Pen. Ascent to Ingleborough.
Stereocaulon condensatum
S. pileatum Ach.
S. coralloides Fr.
S. evolutum Graeve
S. denudatum Floerke and var. *pulvinatum* Th. Fr. Millstone grit, Ingleborough. } On schistose rocks about River Greta.
- Cladina rangiferina* Web. Ingleborough.
C. sylvatica Hoffm. Not uncommon.
C. uncialis Web. Ascent to Ingleborough, and Thornton Force.

* Sometimes spelt Greta.

- Cladonia foliacea* Willd. Near Pecca Falls and below Ingleborough.
C. pyxidata Hoffm. Common.
C. fimbriata Fr. Top of walls about Ingleton.
C. cervicornis Schær. Frequent.
 f. *stipata* Schær. Boulders on Ingleborough.
C. furcata Schmd. Not uncommon.
C. squamosa Hoffm. Below Pecca Falls.
C. subsquamosa Nyl. Woods below Beezley Falls.
C. digitata Hoffm. Not infrequent on decayed trunks of trees in the glens.
C. macilenta Hoffm. Trunks of trees in several places.
C. Floerkeana Fr. Peaty ground below Ingleborough.
Coenogonium ebeneum A.L.Sm. Not uncommon on rocks in the glens.
Gyalecta exanthematica Fr. Ingleborough.
Lecidea confertula Stirt. Boulders below Ingleborough.
L. lucida Ach. Rocks near R. Greta.
L. uliginosa Ach. Crina Bottom.
L. rivulosa Ach. Below summit of Ingleborough and Pecca Falls.
L. protrusa Fr. Rocks below Beezley Falls.
Biatorina cæruleonigricans A.L.Sm. Ingleborough.
B. pilularis Koerb. Tree by R. Greta.
Bilimbia sabuletorum Br. Rost. On walls above Ingleton and Clapdale.
B. aromatica Atta. Not uncommon on limestone.
Buellia canescens De Not. On trees and rocks, frequent.
B. myriocarpa Mudd. Trees in the two glens.
B. parmeliarum Oliv. Parasitic on *Parmelia saxatilis* about R. Greta.
Rhizocarpon Cederi Koerb. Rocks near R. Greta.
R. geographicum DC. Not uncommon.
R. geographicum DC. var. *atrovirens* Koerb. Ingleborough.
R. calcareum Th. Fr. Frequent on the Yoredale limestone on Ingleborough and on walls below.
R. petraeum Massal. On schistose rocks about R. Greta.
R. confervoides DC. Slaty rocks R. Greta and Thornton Force.
Opegrapha atra Pers. Trees near R. Greta.
O. saxicola Ach. Ingleborough.
Coriscium viride A. Zahlbr. Crina Bottom and a fine mass of it on rotten stump of tree below Beezley Falls.
Dermatocarpon miniatum Th. Fr. Rocks in the glens with var. *complanatum* Th. Fr. in damper spots.
D. aquaticum. In the R. Greta and in Kingsdale Beck, especially at Thornton Force.
Arthopyrenia fallax Arn. Trees near R. Greta.
Porina lectissima A. Zahlbr. Rocks near Pecca Falls.
P. carpinea A. Zahlbr. Trees near R. Greta.
P. chlorotica Wain. Ingleborough; walls above Ingleton.

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Men, Books and Birds, by **W. H. Hudson**. London: Eveleigh Nash & Grayson, 368 pp., 16/- net. The publishers have placed another interesting volume on the market, which, in view of the tremendous interest now being taken in Hudson's work, should receive a ready sale. The volume contains a series of letters addressed to Mr. Morley Roberts between 1897 and 1922, together with Mr. Roberts' replies. We have failed to find anything new in them.

Some Other Bees, by **Herbert Mace**. London: Hutchinson & Co. vii.+160 pp., 4/6 net. In addition to half a dozen chapters referring to various Bees, there are chapters dealing with the Idiosyncrasies of Butterflies; Fritillaries; The Butterfly as Traveller; The Wonderful Hawk Moths; and The Evolution of the Caterpillar, etc. Some of the information has previously appeared in *Science Progress*, *The Nineteenth Century*, etc., but are none the less welcome in their present form.

A RARE MAP BY WILLIAM SMITH.

SOME time ago, when I endeavoured to trace the various maps prepared by William Smith, I found a reference to a small-scale map of his which was published in 1827, based on his large map of 1815. In my memoir dealing with 'William Smith: His Maps and Memoirs,' (1917, page 163) I referred to 'A New Geological Map of England and Wales, reduced from Smith's Large Map, exhibiting a General View of the Stratification of the Country; intended as an Elementary Map for those commencing the Study of Geology. London: Published by John Carey, No. 86 St. James's Street, near the Palace.' Evidently in 1820, Carey, who published all Smith's maps, issued a new geological map of England and Wales with the title suggested, and, as was a common practice in those days, by slight alterations to the plate, the title was altered, and 'new editions' prepared. A map identical with that described, was referred to as 'A New Geological Map of England and Wales, with the Inland Navigations, exhibiting the Districts of Coal and other sites of Mineral Tonnage, by W. Smith, Engineer, 1820. London: Published by J. Carey, 87 St. James's Street, March 18th, 1820,' but obviously was intended for a different public.

In my memoir, page 164, I referred to the fact that two similar maps, obviously from the same plate as that of 1820, were discovered in Scarborough, but were uncoloured. The date in the oval title had been altered from 1820 to 1824, and the date of the imprint beneath had been similarly dealt with, though the date of the month, namely March 18th, remained. It seems clear, therefore, that from the same plate different impressions were printed from time to time as orders came in, and were slightly altered as regards date and other details, in order that they might periodically be issued, and thus apparently kept up to date.

I stated (*op. cit.*, page 163) 'A second edition of this map is said to have been published by John Carey in 1827, but so far I have not been able to trace one.' When I wrote that, I was under the impression either that 1827 was a misprint for 1924, or that still further editions had been published which I had not been able to trace.

On a recent visit to the Geological Society of London, however, I found that among the recent additions to the library was a copy of this identical map, bearing the date 1827. It would, therefore, appear that the information I had previously obtained (I believe from the late Professor Judd's numerous papers) was correct, and that in this particular copy we have the latest example of Smith's small-sized map of England and Wales, geologically coloured. It is in its original case, with the curious dark-green mottled

paper and label, and, so far as we can tell, seems to have the same geological information upon it as the earlier editions. It has recently been presented to the Geological Society by Mr. F. G. Jones.—T.S.

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Aquatic Mollusca at Askham Bog.—On the occasion of the excursion of the Entomological Section to Askham Bog on the 13th June, with the assistance of Mr. Arthur Smith, the following aquatic mollusca were observed:—*Limnæa peregra*, *L. palustris*, *Valvata cristata*, *Planorbis corneus*, *P. marginatus*, *P. contortus*, *P. leucostoma*, *P. nautilus*, *Sphærium corneum*, *Pisidium obtusale*, *P. fontinale*. A pond in which *stagnalis* is usually found was not closely approachable, but there is not the slightest reason for supposing that the species has from any cause been exterminated. Owing to the heat and drought, no terrestrial mollusca were observed.—GREEVZ FYSHER.

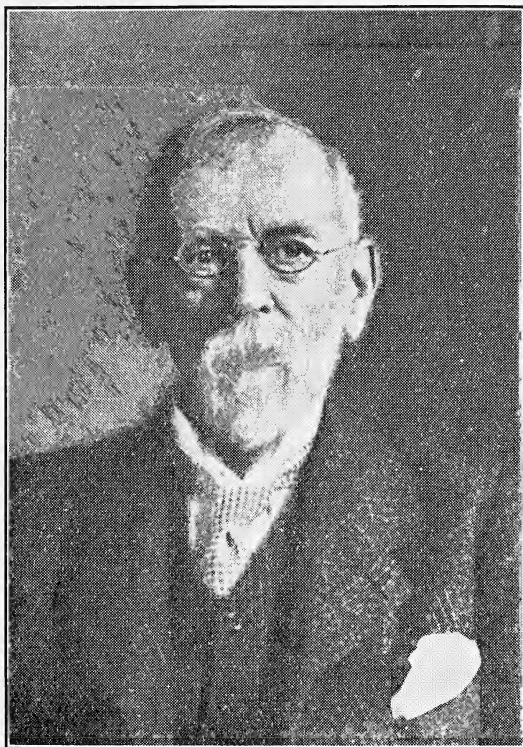
Lake District Collembola.—During a stay in the Lake District at Easter, 1925, the following Collembola were collected:—*Podura aquatica* L., Coniston. *Xenylla grisea* Axels., under bark, Tilberthwaite. *X. maritima* Tullb., in moss on the slopes of the Wetherlam. *Pseudachorutes asigillatus* Börn., under bark, Tilberthwaite. *Friezea mirabilis* (Tullb.), in moss, Grisedale, and on Place Fell. *F. claviseta* Axels., in moss, Patterdale. *Anurida granaria* (Nic.), fairly common on soil under stones, Grasmere, Grisedale and on the Wetherlam. *Onychiurus armatus* (Tullb.), very common. *Neanura muscorum* (Templ.), Grasmere and Great Langdale. *Folsomia quadrioculata* (Tullb.), in moss, Patterdale, Ambleside and on Place Fell. *F. fimetaria* (L.) in moss, Patterdale. *Isotoma sensibilis* Tullb., very plentiful in moss, Place Fell, Ambleside, Patterdale and on the Wetherlam. *I. arborea* (L.), Patterdale, Tilberthwaite. *I. cinerea* (Nic.), Ambleside, Great Langdale and Tilberthwaite. *I. viridis* Bourl., very common. *I. olivacea* Tullb., scarce, in moss, Ambleside. *I. grisea* Tullb., in turf, Coniston. *I. notabilis* Schaff., in moss on an oak trunk, Patterdale. *Tomocerus longicornis* (Müll.), common on the fells, Grisedale, Grasmere, Great Langdale, Tilberthwaite and Coniston. *T. minor* (Lubb.), common. *Isotomurus palustris* (Müll.), common. *Entomobrya nicoleti* (Lubb.), Tilberthwaite, Grisedale. *E. nivalis* (L.), common. *E. muscorum* (Tullb.), Great Langdale, Grasmere. *E. albocincta* (Templ.), on bark, Tilberthwaite. *Lepidocyrtus lanuginosus* (Gmel.), common. *Orchesella cincta* (L.), Tilberthwaite, Grisedale; var. *vaga* (L.), Tilberthwaite.—JAMES M. BROWN, Sheffield, 22nd July, 1925.

In Memoriam.

H. LING ROTH.

(1855—1925).

WE regret to record the death of H. Ling Roth, to whose work the Bankfield Museum at Halifax in its present form is due. Mr. Ling Roth was of a retiring disposition, but a hard



and conscientious worker, and accomplished much more in many ways than is usually known. He had travelled extensively in various parts of the world, and was particularly interested in textiles, and made himself familiar with the technical details of spinning, weaving, etc., in the different continents. He went to live in Halifax in 1888, and for some time voluntarily assisted at the Bankfield Museum, later was appointed half-time keeper, and subsequently he devoted his whole time to the work. The collections there—largely ethnographical—are now well arranged and labelled, and there is an important section devoted to early Halifax, and many

of the objects there were presented by Mr. Ling Roth himself. Though we believe they were published largely at his own expense, the 'Bankfield Museum Notes,' which he issued from time to time, well illustrated his knowledge of different subjects and his great regard for the value of detail.

Writing in *Nature*, Prof. A. C. Haddon states: 'By the death of Mr. Ling Roth the science of ethnography loses a student who has not received the recognition that was due to him. This was mainly owing to his quiet, unassuming disposition, and to the fact that he was not connected with a university or large public institution. His work was characterised by painstaking accuracy, and he had a *flair* for collecting specimens to illustrate the particular subject he had in hand. He was a master of the art of collating information and of presenting scattered records in a readable form, which has been of great use to his fellow-students, but in addition, by his own investigations, he has added considerably to ethnographical knowledge. Most of his memoirs and papers have been enriched by his clever draughtsmanship; his drawings bring out just those details which are essential, and thus really illustrate his theme.

'The range of Mr. Ling Roth's interests is shown by the following imperfect list of some of his writings: "Crozet's Voyage to Tasmania, New Zealand, etc.," 1891; "The Natives of Sarawak and British North Borneo," 2 vols., 1896; "The Aborigines of Tasmania," London, 1890, 2nd ed. Halifax, 1899; "Great Benin: its Customs, Art and Horrors," Halifax, 1903; "The Genesis of Banking in Halifax," Halifax, 1914; "The Discovery and Settlement of Port Mackay, Queensland," Halifax, 1908; "Oriental Silverwork: Malay and Chinese," 1910; "The Yorkshire Coiners, 1767-1783, with Notes on Old and Prehistoric Halifax," Halifax, 1906; "Sketches and Reminiscences from Queensland, Russia and elsewhere," 1916; "The Maori Mantle," 1923.'

A complete list of Mr. Ling Roth's publications is given in *Man* for July.

We are indebted to the editor of *Man* and the editor of *The Halifax Courier* for the accompanying photograph.

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Obituary notices of Herbert D. Astley, A. G. Butler and Henry Stevens appear in *The Ibis* for July.

The Entomologist's Record for June is described as Vol. 37, No. 6, and is 1/-; that for July-August is 'Nos. 6 and 7,' and is 2/6.

R. Stenton has an article on 'Introduction of a Parasite of the Woolly Aphis,' and W. M. Davies on 'Spring-Tails attacking Mangolds' in *The Journal of the Ministry of Agriculture* for July.

'The Migration of the Woodcock in Europe,' by J. Schenk; and 'The Courting Display, etc., of the Eider in the Tay Estuary,' by H. Boase, are the principal contents of *British Birds* for July.

MIDDLETON-IN-TEESDALE AND ITS NATURAL HISTORY.

W. H. PEARSALL, D.SC., F.L.S., AND F. A. MASON, F.R.M.S.

(Continued from p. 218).

WE have received an interesting communication from Mrs. J. Arnott, of the Forest School, with reference to Mr. Malins Smith's notes on the Juniper Scar. Mrs. Arnott says that it is recognised as a fact by the people of the district that sheep do not eat Junipers under any circumstances, and rabbits will only do so under exceptional conditions of food shortage, when they will then nibble the bark. Isaac Allinson, of Dirt Pit,* an old resident, states that fifty years ago there were many more Junipers than are to be seen at present. Substantial reduction in their numbers is accounted for in two ways—by burning to make a clearing, and by cutting or removing for firewood. These Junipers constituted the only firewood material available to the inhabitants of the neighbourhood, and many were rooted up. If a householder required a supply of firewood, he took his horse, fastened a chain round the tree, hooked it on to the harness and away they went. This practice was finally stopped by the land agent owing to the general damage to the property which it entailed.

Mr. Allinson also remembers that there was once a 'worm' under Forcegarth End—the farm overlooking the Scar—this 'worm' being the worm of a still used for making whiskey. He avers that the best whiskey is that made among the heather.

ENTOMOLOGY:—In completion of the Entomological Report of Mr. J. M. Brown (p. 217), Mr. W. J. Fordham writes as follows:—

COLEOPTERA:—Very few beetles were seen, possibly about 30 species. Those more worthy of mention are *Meloe violaceus* Marsh., two specimens taken in a marshy field on the Yorkshire side of the Tees near High Force, and *Orchestes foliorum* Müll. (*saliceti* Pk.), (new to V.C. 65), not uncommon on dwarfed willows by the river at Cronkley Pastures and High Force (Yorkshire side).

DIPTERA:—In spite of the unfavourable weather a total of 57 identified species was obtained, including 2 species previously unrecorded for Yorkshire, and 14 apparently new to Durham. The localities at which these were collected are as follows:—

Yorkshire.—The Yorkshire bank of the River Tees and at Cronkley Pastures.

Durham.—The Durham side of the Tees, near High Force, Hudeshope Beck, and in the vicinity of Heatherbrae.

The counties are indicated by the letters Y. and D. respectively, and the dagger (†) signifies new to Yorkshire, and the asterisk new to Durham. As records are few for the district the complete list is given.

<i>Boletina</i> sp.	D.	*† <i>Rhamphomyia vesiculosa</i> Hn.
* <i>Bibio lacteipennis</i> Ztt.	D.	Y.D.
* <i>Simulium ornatum</i> Mg.	D.	* <i>R. plumipes</i> Fln. D.
<i>Cricotopus tremulus</i> L.	D.	<i>R. dentipes</i> Ztt. Y.D.
* <i>Seromyia femorata</i> Mg.	D.	<i>R. sulcata</i> Mg. Y.D.
<i>Tricyphona immaculata</i> Mg.	D.	<i>Empis trigramma</i> Mg. Y.D.
<i>Erioptera trivialis</i> Mg.	D.	<i>E. tessellata</i> F. Y.
<i>Pedicia rivosa</i> L.	D.	<i>E. bilineata</i> Lw. Y.
<i>Microchrysa polita</i> L.	Y.	<i>E. chioptera</i> Hn. Y.
<i>Beris chalybeata</i> Först.	D.	<i>E. opaca</i> F. D.

* Mrs. Arnott says 'Dirt Pit' is a corruption of Deer Path. It was originally the path taken by the deer through the forest.

- **Tachydromia agilis* Mg. D.
 **T. longicornis* Mg. D.
 **Bicellaria pilosa* Ldbk. D.
Hilara maura F. D.
Chilosia albitarsis Mg. Y.D.
Platycheirus albimanus F. D.
P. manicatus Mg. D.
Melanostoma scalare F. D.
M. mellinum L. D.
Rhingia campestris Mg. D.
Syrphus ribesii L. D.
S. vitripennis Mg. D.
Ascia podagrica F. Y.D.
Eristalis intricatoris L. D.
E. pertinax Scop. D.
E. arbustorum L. D.
Sericomyia lappona L. D.
Chrysostomum arcuatum L. Y.
Myiospila mediatubunda F. D.
Mesembrina meridiana L. D.
- **Phaonia consobrina* Ztt.(?) D.
 **Trichopticus longipes* Ztt. D.
 **T. nigritellus* Ztt. D.
Hydrophoria linogrisea Mg. D.
Hylemyia variata Hm. Y.D.
H. strigosa F. Y.D.
Azelia macquarti Stæg. D.
Anthomyia æstiva Mg. Y.D.
Cælomyia spathulata Ztt. D.
 **Norellia striolata* Mg. D.
Scatophaga squalida Mg. D.
S. suilla F. Y.D.
S. stercoraria L. Y.D.
 †*Sapromyza affinis* Ztt. Y.
 **Hydrellia griseola* Hn. D.
Borborus equinus Hn. Y.D.
B. niger Mg. Y.
 **B. nitidus* Mg. D.

There are also about 20 species as yet undetermined.

I am much indebted to Mr. Grimshaw for kindly verifying or naming most of the above mentioned species.

LICHENS (W. E. L. Wattam):—The district under investigation has been attractive to the students of British Lichens from very early times, as is proved by the records appearing in Leighton's 'Lichen Flora of Great Britain' (1871), and the 'Monograph of the British Lichens.' I have incorporated these records with my own observations so that a more comprehensive list may be available for future reference. I traversed a large portion of the expanse known as Cronkley Moor, to Long Crag, then from Black Bands down Green Mines Moss to the banks of the Tees opposite Falcon Clints. This area was in an excessively wet condition, and supported among the plant life immense colonies of *Cladina sylvatica* and *Cladina uncialis* in varied form, which, when the stony ridge was reached, gave place to *Cetraria islandica* and *C. aculeata*, with *Solorina saccata* in mossy peaty hollows. A pleasing picture was presented by a portion of burnt moor, upwards of an acre in extent, which was controlled by *Cladonia coccifera* with fructification so plentiful as to give a most pronounced crimson colouration to the ground. The following is a list of species now known to occur:—

- Coniocybe sulphurea* Nyl.
C. pallida Fr.
Sphaerophorus melanocarpus Schaer.
S. globosus A.L.Sm.
S. fragilis Pers.
Spilonema Scoticum Nyl.
Ephebe lanata Wain.
Collema pulposum Ach.
C. tenax Sm.
C. multifidum Schaer.
Synechoblastus Laureri Flot.
S. multipartitus Mudd.
Leptogium sinuatum Massal.
 var. *scotinum* Koerb.
L. saturninum Nyl.
Parmeliella plumbea Wain.
Pannaria rubiginosa Del.
 var. *conoplea* Koerb.
P. pezizoides Leight.
Massalongia carnosa Koerb.
- Peltigera canina* Willd.
P. rufescens Hoffm.
 var. *prætextata* Nyl.
P. aphthosa Willd.
 var. *leucophlebia* Nyl.
P. horizontalis Hoffm.
Solorina saccata Ach.
S. spongiosa Carroll.
Sticta limbata Ach.
Lobaria scrobiculata DC.
L. pulmonaria Hoffm.
L. laciniata Wain.
Parmelia physodes Ach.
 var. *tubulosa* Mudd.
P. pubescens Wain.
P. corniculata A.L.Sm.
P. perlata Ach.
 var. *ciliata* Schaer.
P. caperata Ach.
P. Mougeotii Schaer.

- Parmelia scortea* Ach.
P. saxatilis Ach.
 f. *furfuracea*.
P. hyperopta Ach.
P. lævigata Ach.
P. conspersa Ach.
P. fuliginosa Nyl.
 var. *lætevirens* Nyl.
P. omphalodes Ach.
Cetraria glauca Ach.
C. juniperina Ach.
C. pinastri S. F. Gray.
C. sepincola Ach.
C. chlorophylla Wain.
C. hepaticum Wain.
C. islandica Ach.
 var. *tenuifolia* Wain.
Ramalina fraxinea Ach.
R. fastigiata Ach.
R. farinacea Ach.
R. pollinaria Ach.
R. siliquosa A.L.Sm.
Evernia prunastri Ach.
E. furfuracea Mann.
 f. *ceratea* Cromb.
Usnea florida var. *hirta* Ach.
U. barbata Webb in Wigg.
Alectoria nigricans Nyl.
A. bicolor Nyl.
A. jubata Ach.
Xanthoria lychnea Th. Fr.
X. parietina Th. Fr.
Placodium murorum D. C.
Pl. aurantiacum Hepp.
 var. *flavovirescens* Hepp.
Pl. ferrugineum Hepp.
 var. *festivum* A. L. Sm.
Pl. cerinum var. *stilicidiorum* Hepp.
Candelariella vitellina Müll-Arg.
C. epixantha A. L. Sm.
Physcia ciliaris DC.
P. pulverulenta Nyl.
P. hispida Tuck.
P. cæsia Nyl.
P. lithotea Nyl.
Rinodina robarris Arn.
Lecanora cartilaginea A.L.Sm.
L. gelida Schaer.
L. muralis Schaer.
L. subimbricata A.L.Sm.
L. subfusca and var. *chlarona* Ach.
L. rugosa Nyl.
L. campestris B. de Lesd.
L. atra Ach.
L. Hageni Ach.
L. cenisia var. *atrynea* Harm.
L. subcarnea Ach.
L. galectina Ach.
 sub. sp. *dispersa* Nyl.
 sub. sp. *dissipata* Nyl.
Lecanora varia Ach.
L. conizæa Nyl.
L. symmicta Ach.
L. effusa Ach.
L. badia Ach.
L. sulphurea Ach.
L. polytropæa Schaer.
L. tartarea Ach.
 var. *frigida* Ach.
L. parella Ach.
 var. *Turneri* Hyl.
L. cinerea Sommerf.
L. calcarea Sommerf.
 var. *contorta* Hepp.
L. gibbosa Nyl.
L. recedens Nyl.
L. Dicksonii Nyl.
L. Prevostii Th. Fr.
 var. *affinis* Nyl.
L. epulotica Nyl.
Acarospora glaucocarpa Koerb.
A. smaragdula Massal.
A. candicans A. Zahlbr.
Lecania syringæa Th. Fr.
Icmadophila ericetorum A. Zahlbr.
Hæmatomma ventosum Massal.
Pertusaria faginea Leight.
P. multipuncta Nyl.
P. pertusa Dalla T and S.
P. Wulfenii DC.
P. dealbata Cromb.
Thelotrema lepadinum Ach.
 var. *scutelliforme* Ach.
Diploschistes scruposus Norm.
Crocynia lanuginosa Hue.
Gyrophora proboscidea Ach.
G. polyphylla Hook.
G. cylindrica Ach.
G. torrefacta Cromb.
 f. *exasperata* Mudd.
G. polyrrhiza Koerb.
Umbilicaria pustulata Hofim.
Bæomyces rufus DC.
Stereocaulon condensatum Hoffm.
S. nanum Ach.
S. coralloides Fr.
S. evolutum Graeme.
S. denudatum Floerke.
 var. *pulvinatum* Th. Fr.
S. tomentosum Fr. var. *botryosum* Ach.
Cladina sylvatica Hoffm.
C. uncialis Web. and f. *elatio* Fr.
Pycnothelia papillaria Hoffm.
Cladonia pyxidata Hoffm.
 f. *simplex*.
 f. *syntheta*.
 var. *pocillum* Fr.
 var. *chlorophæa* Floerk.
C. fimbriata Fr.

- Cladonia pyxidata* Hoffm.
 var. *simplex* Wain.
 sub. sp. *fibula* Nyl.
C. degenerans Spreng.
C. cervicornis Schaer.
C. gracilis Willd.
 var. *chordalis*.
C. cariosa Spreng.
C. furcata Schrad.
C. squamosa Hoffm.
C. deformis Hoffm.
C. coccifera Willd.
C. bellidiflora Schaer.
C. flabelliformis Wain.
C. macilenta Hoffm.
 var. *scabrosa* Cromb.
C. Floerkeana Fr.
Gyalecta foveolaris Schaer.
G. cupularis Schaer.
Lecidia lurida Ach.
L. decipiens Ach.
L. lugubris Sommerf.
L. coarctata Nyl.
 var. *elacista* Cromb.
L. Brujeriana Nyl.
L. granulosa Schaer.
L. flexuosa Nyl.
L. demissa Th. Fr.
L. uliginosa Ach.
L. leucophæa Nyl.
L. sanguineoatra Ach. var. *Temple-*
 toni Wain.
L. panæola Ach.
L. subumbonella Lamy.
L. contigua Fr.
 var. *flavicunda* Nyl.
L. confluens Ach.
L. lithophila Ach.
L. expansa Nyl.
Biatorina flava A.L.Sm.
- Biatorina cæruleonigricans* A.L.Sm.
B. Griffithii Massal.
B. synothea sub. sp. *subnigrata*
 A.L.Sm.
Bilimbia aromatica Jatta.
B. sabuletorum Branth. and Rostr.
Bacidia luteola Mudd.
B. inundata Koerb.
B. arceutina Branth and Rostr.
B. umbrina Branth and Rostr.
Buellia myriocarpa Mudd.
B. Parmeliarum Oliv.
Rhizocarpon alboatrum Th. Fr.
R. geographicum DC.
R. viridiatrum Koerb.
R. calcareum Th. Fr.
R. confervoides DC.
R. obscuratum Massal.
Lepadium fuscoluteum Mudd.
Opegrapha varia Pers.
Arthonia radiata var. *Swartziana*
 Sydow.
A. pruniata Steudel.
Encephalographa cerebrina Massal.
Lithographa tesserata Nyl.
Coriscium viride A. Zahlbe.
Dermatocarpon minutum Th. Fr.
 f. *decipiens* A. L. Sm.
 var. *complicatum* fth. Fr.
D. aquaticum A. Zahlbr.
Verrucaria margacea Wahlenb.
V. aethiobola Wahlenb.
V. coerulea DC.
V. glaucina Ach.
V. muralis Ach.
V. rupestris Schrad.
V. calciseda D.C.
Thrombium epigæum Wahlbr.
Staurothele umbrina A.L.Sm.

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Nature Rambles in Somerset, by **H. V. Webb**. London: Folk Press, Ltd., 98 pp., 1s. 6d. net. This is a reprint of various papers which have appeared in *The Bristol Times and Mirror*, and it is hoped may be acceptable in the present form. The articles are of the usual type which one expects in provincial newspapers, but the illustrations are poor, some being particularly ancient.

The Natural History of Wicken Fen, by **J. Stanley Gardiner**. Cambridge: Bowes & Bowes, Part II., 65-171 pp. Professor Gardiner has now brought out Part II. of this work, in which he deals with Insects of the Natural Orders. Wicken and Burwell Fens Fifty Years ago and Now; Hirudinea; A Preliminary Account of the Hemiptera-Heteroptera; The Spiders and Harvestmen; The Phytoplankton of the Wicken Fen Area; A Preliminary Account of the Ichneumonidae; The Higher Crustacea; The Mollusca of Wicken Fen; and The Hydrogen Ion Concentration of the Waters of Wicken Fen. The Editor has been successful in this work in securing the co-operation of W. J. Lucas, Dr. A. H. Evans, W. A. Harding, G. V. Hutchinson, W. S. Bristowe, Dr. B. M. Griffiths, G. L. A. Hancock, J. O. Cooper, H. H. Brindley, and J. T. Saunders.

FIELD NOTES.

Pigmy Shrew at Spurn.—On June 11th I picked up a dead specimen of the Lesser Shrew on the road, at Kilnsea, between the "Blue Bell" and the sea.—R. FORTUNE.

Nesting of Short-eared Owl at Whitby.—I record the nesting of the Short-eared Owl on the Whitby Moors. Three young were successfully reared out of four eggs laid, one egg being addled. In the nest, when I found it on May 24th, were four shrew mice and one short-tailed field vole, all entire, and on another occasion the feathers of a common snipe.—W. S. MEDLICOTT.

Green Sandpiper in East Yorkshire.—I flushed one of these birds on July 21st on the mill dam above the Lowthorpe Mill. My keeper told me that he first saw it about a fortnight ago. I have notes of at least one other occurrence at Lowthorpe in July, but never earlier in the summer, and have no reason to think that they have ever bred in the neighbourhood.—W. H. ST. QUINTIN.

Carex lasiocarpa Ehrh. (*C. filiformis* L.) near Austwick, V.C. 64.—In the dry summer of four years ago, Dr. Pearsall noticed a sedge in a very wet patch of ground near Austwick. The plants were not then in fruit, but the habit suggested *Carex lasiocarpa*. On June 28th I went with Dr. Pearsall to the bog, and owing to the dry conditions we were able to reach the sedge, which was in fair quantity, but only a small proportion was in fruit. This is a very interesting record of a sedge which has become very rare in Yorkshire in the last 50 years, as the 'carrs' and bogs have gradually been drained and brought under cultivation.—W. ARTHUR SLEDGE.

A Whooper Swan in June.—On June 6th, while watching a tame-bred Pink-footed Goose 'planing' down to the lake after circling round as it often does of an evening, I was surprised to see a swan following the goose in its descent. It alighted on the water about 200 yards from where I was standing, and instantly noticed me, and floated motionless for a minute or two, watching me intently as I stood under a tree. With my binoculars I easily identified it as an adult Whooper. Later I watched it from the house with a telescope, and noticed that though evidently very hungry, it never seemed to find any water-weed that it cared for, and presently it was missing and evidently had moved on. It is a very unusual time of year for such a bird to visit this country; but, after all, not more strange than that a Great Bustard should find itself, quite recently, on one of the Orkneys in mid-winter, or a Red-breasted Goose in Norfolk two summers ago, which, after exhaustive enquiries in this country and on the continent, appears to have been a *bona fide* wild 'stray.' The fact is one is inclined to underestimate the

facility with which large birds of powerful flight can travel, and the distance they may wander, when once they have lost their bearings.—W. H. ST. QUINTIN, Scampston.

Sexual Attraction in Lepidoptera.—At 7-15 p.m., June 21st, 1925, I was removing a few larvæ of *L. salicis* from a sleeve and found therein a fresh female of *C. podana*. I boxed the moth, put the caterpillars in a cage, inverted and shook out the sleeve. Within a few minutes six male *podana* arrived, flew about for a short time, and then found the sleeve and explored it with great industry. The female moth was in an inner pocket; the males showed no interest in me whatever. *C. podana* is common in my garden, but none was to be seen before the shaking of the sleeve, or 15 minutes later. It was a little early for the normal flight of the insect. The female in my pocket was still present when the males ceased to arrive. This appears to demonstrate the fact that the attractive sexual element is material, and acts through a sense analogous to the sense of smell in higher organisms.—H. DOUGLAS SMART, Woodford Green, Essex.

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Mr. R. E. M. Wheeler has a well illustrated account of the Roman Remains on the Cardiff Racecourse; A. R. Jackson writes on 'The Spiders of South Wales'; G. C. S. Ingham and H. M. Salmon contribute 'Ornithological Notes,' and H. M. Hallett gives 'Entomological Notes,' in *The Transactions of the Cardiff Naturalists' Society*, Vol. LV.

The Royal English Arboricultural Society has arranged a series of provincial meetings for the purpose of affording an opportunity to land-owners, land agents and others to study various systems of woodland management on the ground, and of fostering a greater interest in Forestry generally. Particulars of these may be obtained from the Secretary, Mr. E. Davidson, Estate Office, Haydon Bridge, Northumberland.

Besides the reports of the various sectional officers (Messrs. J. F. Musham, A. E. Musgrave, G. H. C. Haigh, F. Hind, A. Smith, and Miss Stowe), of the Lincolnshire Naturalists' Union, the Union's *Transactions* for 1924 contain Mr. H. B. W. Smith's Presidential Address on 'The Moorland and Upland Flora'; Mr. A. Smith's Secretarial Report; 'Illustrated Notes on Tachinid Flies,' by H. W. Miles; 'Mosses of the Lincolnshire Coast,' by G. H. Allison; and an account of 'The Twentieth President of the Lincolnshire Naturalists' Union, the Rev. F. S. Alston'; a title which, at long last, is correct.

The *Proceedings of the Spelæological Society, University of Bristol*, contain a remarkable series of monographs dealing with excavations in caves, barrows, camps, and other prehistoric and later sites. The reports are by Messrs. J. A. Davies, L. H. D. Buxton, E. Fawcett, E. T. Newton, and a host of others; most of the articles being well illustrated. Valuable additions have been made to our knowledge of early British mammals and birds by Messrs. Hinton and Newton. Mr. M. C. Burkitt, in 'Notes on Maglemose Culture,' oddly enough, apparently accepts the authenticity of the Holderness curios. In describing a bronze celt found in Gloucestershire, Mr. Davies says 'there were no other associated implements, but it is manifest that if the celt was part of a small hoard, other specimens might have been lost.' Quite! And if it had been part of a large hoard there might have been more! Oh, that if!

CORRESPONDENCE.

THE GRASSLANDS OF YORKSHIRE COAL MEASURE AND LIMESTONE SOILS.

May I in slight supplement to the valuable paper on this topic by Mr. Swarbrick in the July *Naturalist*, remark that the month of June affords an interesting demonstration of the contrast between the relatively acid soils of the Coal Measures and the alkaline soils of the Magnesian Limestone. There are in the neighbourhood of Leeds many outliers and spurs from the Magnesian Limestone which rest on Coal Measures (or Millstone Grit), and at this season when *Rumex acetosella* is in flower the meadows up to a neatly ruled line are ruddy with this plant. The line marks very nearly the boundary between the two formations.—
PERCY F. KENDALL.

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NEWS FROM THE MAGAZINES.

For the small price of ten pence Messrs. George Bell & Son, London have issued the eleventh edition of the well-known *London Catalogue of British Plants* (58 pp.).

W. G. Sheldon refers to 'A Committee for the Protection of British Lepidoptera,' W. J. Lucas gives 'Notes on British Neuroptera in 1924,' in *The Entomologist* for July.

Mr. D. Seth-Smith, the editor, contributes a well illustrated account of the Argus Pheasant and its display, and a portrait and notes on the late A. G. Butler, to *The Avicultural Magazine* for July.

'Three Species of Staphylinidae, new to Britain,' by M. Cameron; and 'Nesting Habits and Prey of two British Crabronidae,' by H. Scott, occur in *The Entomologist's Monthly Magazine* for July.

Illustrations of the Ancaster Deae Matres, and of the Ancaster Roman Inscribed Stone, as well as of recent additions, appear in *The Third Annual Report of the Grantham Public Library and Museum* for 1924-5.

Man for July contains a portrait of Professor A. C. Haddon from the painting by P. A. de Laszlo. We must admit the portrait gives an impression of a much more ferocious person than the charming Dr. Haddon as we met him last.

Mr. P. H. Grimshaw writes on 'The Food of the Ptarmigan'; Mr. O. H. Wild on 'Sea-birds and Oil'; and the Misses E. V. Baxter and L. J. Rintoul give their Report on Scottish Ornithology in 1924, in *The Scottish Naturalist* for May-June.

The Journal of Conchology for July contains a memoir on the late R. Standen, by J. W. Jackson; '*Vertigo genesii* in Ireland,' by D. W. Stelfox; 'Albinism in European Clausiliidae,' by J. R. le B. Tomlin; 'The Habits of *Hygromia fusca* (at Scarborough),' by W. E. Atkins; 'Albinism in European Clausiliidae,' by Dr. A. H. Cooke, and '*H. aspersa* new to Kincardineshire,' by E. Crapper.

The London Naturalist, the Journal of the London Natural History Society, for 1924 (46 pp., 3/-), contains a sheaf of valuable reports and records in different sections, as well as papers on 'London Birds, 1922-24,' by A. H. Macpherson; 'Epping Forest Hepatics,' by J. Ross; '*Viola odorata* var. *imberbis*,' by E. B. Bishop; 'Violets of Limpsfield Common,' by R. W. Robbins; 'Birds of Walthamstow Reservoirs,' by R. W. Pethen.

Whenever the occasion occurs, *Nature* rises to the occasion. And in its issue for May 9th there is a special supplement of over 50 pages dealing with the Centenary of Huxley. We remember, years ago, on securing a set of *Nature*, turning to the first article in the first number, and being infatuated on reading Huxley's contribution thereto. Huxley started *Nature* well; and happily *Nature* now pays its tribute to Huxley. Anyone wanting to know what Huxley accomplished, should see *Nature* for May 9th.

NORTHERN NEWS.

Our contributor, Mr. D. A. Jones, M.Sc., has been elected an Associate of the Linnean Society.

Jeffreys' own interleaved copy of 'British Conchology' is now in the Radcliffe Library, Oxford, having been presented by the author's daughter, Mrs. W. J. Sollas.

The editorship of the *Bulletins of the South-eastern Union of Scientific Societies* has been changed this year, and we are, therefore, enable to provide our readers with any quaint extracts.

We regret to announce that Dr. F. E. Beddard, D.Sc., F.R.S., zoologist and author, who was for many years Prosector to the Zoological Society of London, died suddenly recently at his residence at West Hampstead at the age of 67.

The National Museum of Wales has issued a Guide to the Groups of Mammals in that institution. It is written by Dr. J. J. Simpson, contains 24 pages, four illustrations, and is sold at three pence. It refers to the more common British Mammals.

Mr. A. Sich writes on *Phyllocnistis sorhageniella*; R. Verity on the evolution of the *Zygaenae*, and the classification of the variations of *Z. lonicerae*, *Z. trifolii*, etc. There is a note on an observation of *Ruralis betulae*, and H. Donisthorpe describes *Lissodema kirkae*, a new coleopteron, in *The Entomologist's Record* issued in July.

At the recent congress of the South-eastern Union of Scientific Societies, Mr. E. A. Martin spoke on 'Some Controversial Points in Anthropology.' 'In dealing with the pictorial representations of the human form on palaeolithic cave walls, he made the suggestion that we may have here preserved what were really monstrous forms of the human race, when the species was scarcely fixed, and the race was still in a plastic condition.'

Part VII. of Sherborn's invaluable *Index Animalium* has been issued by the Trustees of the British Museum. It is a work of exceptional value to the serious student of natural history. The present part contains the entries Concolor to Czizeki, published during 1801-1850, and includes pp. 1453-1771. It seems that during the half century covered by this Index over two hundred species received the name *cylindrica* or similar name, full details of which occur in this publication.

—: o :—

The Book of Silchester, by James Thomson. London: Simpkin, Marshall, Hamilton Kent & Co., 2 Vols., xx,+400 pp. and 401—752 pp., £3 3s. net. The sub-title gives an idea of its scope: 'The Dramatic Complementary History of the Remarkable Atrebatian Stronghold which became the Imperial Municipality called Calleva Atrebatum, the third free city of the Romano-Britannic Province, more commonly known as the ruins of Silchester.' Few cities have so enthusiastic a historian, and few have produced such wonderful evidences of Roman and later occupation as the result of excavations. Mr. Thomson figures and describes an extraordinary series of discoveries relating to Romano-Britain, for which Silchester is world famous. Hitherto the accounts of the various finds have appeared in numerous journals, but here all these have been collected together, and by the aid of scores of magnificent blocks, present a story as fascinating as it is important. The first volume deals with early Britain through various vicissitudes to the modern parish of Silchester, the second is Archaeological, and refers more particularly to the Roman site, the various buildings which have been exposed, the mosaics, coins, seals, pottery, sculptures, inscriptions, etc., which have been discovered. There are also chapters on heating, lighting, sanitation, industry, arts and crafts, and food supply. The work is limited to 350 copies, and there is no doubt that it will soon be a scarce one.

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PRINCIPALLY FOR THE NORTH OF ENGLAND.

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NOTES AND COMMENTS.

ROMAN HUDDERSFIELD.

The Borough of Huddersfield and Dr. Woodhead are to be congratulated on the continued high standard of *The Tolson Memorial Museum Publications*; Handbook IV., entitled 'Huddersfield in Roman Times,' by Ian A. Richmond, has just appeared. It contains 116 closely printed pages, many illustrations, and is sold at the price of one shilling, though we feel sure each copy has cost more. Roman roads and relics receive considerable attention, and there is an appendix recording the various Roman coins found in the area.

A NEW BRITISH LAND PLANARIAN.

Mr. E. Percival records (*Quart. Journ. Micr. Science*, March, 1925) the finding of a new British land planarian—*Rhynchodemus britannicus*. He collected specimens in Yorkshire under large stones and logs which had lain undisturbed for a considerable time, always on moist clay or loam, and associated with earthworms and slugs, never with centipedes and carnivorous beetles. The planarian, which is extremely contractile, may attain a length of 90 mm., and is 1.5 mm. broad when in the extended condition. The anterior end tapers gently to a fine point, and just behind the tip is a single pair of minute eyes. The colour is variable—sulphur-yellow, salmon-pink, or dirty grey, and the ventral surface is paler, the mid-ventral region being practically white. The mouth is mid-ventral, and about the middle of the length of the worm, and the genital pore 5-8 mm. farther back. Mr. Percival gives a brief account of the anatomy, which is similar to that of other species of *Rhynchodemus*. The cocoons are 2 to 3 mm. in diameter. The planarian feeds on earthworms, sucking up the partly decomposed tissues of the worm and leaving only the cuticle, but how the worms were killed could not be ascertained. In one specimen many spores of a gregarine, probably *Monocystis*, were present in the endoderm cells, no doubt ingested while feeding on an earthworm. Two examples of this new species have also been collected at Stockport, and the author thinks that a specimen found at Plymouth probably also belonged to this species, in which case this new planarian would appear to be widely distributed in England.

OIL AND EGGS.

A writer in *The Yorkshire Evening Post* has been interviewing one of the Bempton 'climbers.' Speaking of the alleged fewer birds, the climber says: "'And for why? You can't get eggs if you can't get birds. Some say we have been climmin' them out. It's not that. What's the good of protecting the birds wi' one hand if you're going to twist

their necks round, in a manner of speaking, with the other? It's oil, sir, that's what it is. Oil that's making some folks fortunes, but's the ruination of us. Mebby you've seen birds on the shore smeared wi' the stuff. It's worse here. It's never been so bad. But what can you expect. Not only ships a-pumping it out every day, but hundreds of boats, what would reach from Flamborough to Scarborough, under the sea, still letting it loose. They were bowled over during the war, and all the oil can't have left 'em yet. It's that oil, sir. It sticks worse nor treycle. I've had to scrape it off the eggs wi' a knife. It's smeared on all the ledges. I've seen this year what I haven't seen afore—a kittiwake that flew away with a nest and eggs as well stickin' to her.' '

A PAVEMENT FOSSIL.

Under the above heading a London daily paper recently printed the following note, together with the second illustration



appearing below: 'The above sketch, from a drawing in *The Lancet*, shows a fossil which has been found in a curious manner in London. Mr. Vere G. Webb writes that for 18 months he has been watching a curious mark in a York paving stone near his home on Haverstock Hill, Hampstead. The wear and tear of innumerable feet have brought to light a fine section of a bovine head, showing crest, horns with their cores, one orbit, one nostril, and muzzle. Mr. Winter, the Hampstead Borough Engineer, has had the stone removed to the Town Hall.' As we had our doubts about a cow having wandered about in Carboniferous times, we asked the Borough Engineer to favour us with a photograph, and from it we have very carefully traced the first of the two figures. What the stains on the flagstones are we cannot say, but they have clearly nothing to do with a cow.

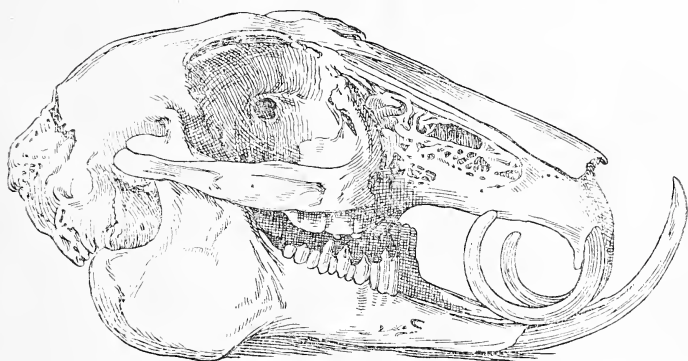
KELLAWAYS AMMONITES.

In Part LII. of *Type Ammonites*, Mr. S. S. Buckman informs us that 'Specimens collected from Kellaways Rock

and subjacent beds of Wiltshire by the Geological Survey show that *Gulielmiceras gulielmi*-like forms are from the base of the Kellaways Rock, and not from the upper part, as was supposed; also that something resembling the *Catacephalites* faunas of South Cave, Yorkshire, occur in a similar position, and therefore do not indicate Macrocephalitan date. Study of the faunas of Christian Malford and Calvert show that, possibly, many species assigned to the date of *athleta*, coming from the Kelloway [*sic*] Rock of Yorkshire, are earlier, possibly as early as *hoplistes* and *zugium* of Kosmoceran. The Kelloway Rock of Yorkshire is a stratum much condensed, with many lacunæ, and it took from ages Proplanulitan to Vertumniceratan to deposit it.'

MORE CHATS ON BRITISH MAMMALS.*

Following his little work, 'Chats on British Mammals,'



noticed in our journal for April, Dr. Simpson has produced a companion volume devoted to rodents and bats, this also being a result of his Broadcasting Talks, which were reported in the South Wales newspapers. We are permitted to reproduce one of many interesting illustrations herewith. It represents the skull of a hare showing an abnormal growth of the incisor teeth, due to damage to the teeth when young.

THE FOOD OF THE OYSTER.†

This report is principally concerned with the possible causes of the 'fattening' of oysters. Monthly analyses of the food taken in by oysters from two beds at Orford, Suffolk, were made throughout a year. In one of these beds oysters fatten much better than in the other. The chief results were:—(1) Feeding was practically limited to summer and autumn, with a maximum in August and September; (2)

* By J. J. Simpson, D.Sc. London: Sheldon Press, 125 pp., 2/6 net.

† Fishery Investigations, Series II., Vol. VIII., No. 1., 50 pp., price 8/-.

The greater part of the food consisted of organic detritus, animate food never exceeding 10 per cent. ; (3) There was a definite difference in the quantity and quality of the animate food in the oysters from the two beds. (4) There is an apparent relation between the consumption of diatoms (microscopic plants) and 'fattening'; one particular species of diatom is indicated as the principal cause.

CHEMISTRY OF IGNEOUS ROCKS.

Under the heading of 'The Physical Chemistry of Igneous Rock Formation: A General Discussion,' a record has been published by the Faraday Society, the Geological Society and the Mineralogical Society.* This contains the following contributions :—'Introductory Address,' by Dr. J. S. Flett ; 'Review of Recent Work on the Origin and Differentiation of Igneous Rocks,' by G. W. Tyrrell ; 'Homogeneous Equilibria in Magmatic Melts and their Bearing on the Processes of Igneous Rock Formation,' by Prof. Paul Niggli ; 'Some Ultimate Problems in Petrogenesis,' by W. A. Richardson ; 'Magmatic Ores,' by J. W. Gregory ; 'Proposed Researches on the Chemistry and Physics of Igneous Magmas and Rocks,' by J. W. Evans ; 'The Theory of Crystallisation in Rock Magmas,' by C. H. Desch ; 'Some Physical Properties of Silicate Glasses and their Possible Bearing on the History of Igneous Rocks,' by W. E. S. Turner ; 'The Formation of Eutectic and Similar Rock Formation,' by A. Scott. The discussions on the various papers are also published.

BRITISH COPPER ORES.

At the remarkably low price of two shillings, Volume XXX. of the Special Reports on the Mineral Resources of Great Britain has been issued by H.M. Geological Survey. The present volume deals with Copper Ores of the Midlands, Wales, the Lake District and the Isle of Man, and is by Henry Dewey and T. Eastwood, with contributions by others. Reference is made to the mines now being worked, or which have formerly been worked for copper ores, and evidence is produced of Roman, if not still earlier, mining, in the area under discussion, though to-day copper mining is not of very much importance in these parts. There are several plans and other illustrations in the text, the whole making an important contribution to the mineralogical literature of Britain.

DANES' DYKE : AS IT WAS NOT.

It is interesting sometimes to compare drawings of well-known topographical features with actual photographs, and the disparity is often startling. Few instances, however, have proved so noticeable as the engraving of Danes' Dyke appearing in Volume IV. of Allen's 'History of the County

* pp. 413-501. 6/6 net.

of York,' 1831, and a photograph, which is reproduced here-with, taken from the same view-point. The plate bears the



inscription 'N. Whittock, Delt. J. Rogers, Sc.' Possibly each of these gentlemen has 'added a bit!' Those familiar with

AND AS IT IS.



Danes' Dyke will be interested to see the carriage shown as being driven along a rocky ledge in the distance.

CUMBERLAND BLACK LEAD IN 1684.

In an account of 'Early Science at Oxford,' in a recent issue of *Nature*, under date 1684, we learn that 'Dr. Plot

presented ye Society with an Elf Arrow [flint arrow head] brought from within two, or three, miles of Edinborough, where they are in great plenty. He shewed also some naturall gold of Scotland in a pepin, or great grain, and he also communicated an account of Black Lead found onely in Keswick in Cumberland, and there called Wadt, or Kellow.'

WATER MOVEMENTS IN THE NORTH SEA.*

During the year September, 1920, to September, 1921, the Ministry of Agriculture and Fisheries carried out very extensive experiments with drift bottles in the Southern North Sea. At each of seven light-vessels (four English, two Dutch and one French), fifty bottles were put out each week. Half the bottles were floaters and half bottom trailers. The aim was to obtain information as to the water movements associated with differing wind conditions, and to see if there existed any seasonal variations in the currents. The present report deals with the surface floating bottles, of which two-thirds were returned. A parallel study of wind and drift is made, and conclusions as to their interdependence are arrived at; broad generalisations as to seasonal changes in the surface water movements are made.

DERBYSHIRE AGAIN.

According to *The Daily Mail*, which had an 'exclusive article' on the subject, three burial vases have been found in Derbyshire, and hailing from that county we are not at all surprised to find that one of the vases is 'probably one of the finest Celtic remains found in this country. The finding of three urns within a space of three yards is probably almost unique.' They are also 'believed to be thousands of years old.' Oddly enough, the press has not yet been flooded with photographs of these vases, but we will undertake to produce half a dozen better ones, and certainly many other Museums can do the same. A brief reference to Greenwell's 'British Barrows,' Mortimer's 'Forty Years' Researches,' or other standard publications would have shown that finding three vases within three yards was anything but '*almost unique*,' whatever that may be!

—:o:—

Prof. A. C. Seward, F.R.S., favours us with a copy of his address, 'Records of Ancient Plants within the Empire: What we know and what we need,' reprinted from the *Report of the Imperial Botanical Conference, London*. He also sends the Masters Lecture for 1924, on 'Arctic Vegetation, Past and Present,' reprinted from *The Journal of the Royal Horticultural Society*, Vol. L., Pt. 1, 1925.'

* Fishery Investigations, Series II., Vol. VIII., No. 2—The Water Movements in the Southern North Sea. Part I.—The Surface Drift, by J. N. Carruthers. London: H. M. Stationery Office, 119 pp., price 14/- net).

NOTES ON YORKSHIRE AMMONITES.

DR. L. F. SPATH.

V.—ARIETITES, ASTEROCERAS, AND ALLIED GENERA.

A NUMBER of groups of Yorkshire Ammonites belonging to the family *Arietidae* in the wider (Hyatt's) sense¹ require discussion, but in the present article it is intended to review only some stocks of the restricted family *Arietidae*.² The Yorkshire Lias is especially famous for its *Eparietites* (= group of *Ammonites collenotii* d'Orbigny, *A. tenellus* J. Buckman, *A. impendens* Young and Bird, *A. denotatus* Simpson), and for its 'degenerate *Asteroceras*,' exemplified by the well-known '*Aegoceras sagittarium* Blake.' This last was quite erroneously interpreted by Wright³ as a variety of Sowerby's *Ammonites jamesoni* of much higher beds, and, like *Eparietites*, is unknown from the Dorset Coast. It is assumed that there is a non-sequence between the *stellare* and *lymense* zones as already mentioned (p. 109). Dr. W. D. Lang, in a forthcoming paper on the Dorset sequence, will give details of the upper beds of the 'Black Marls.' In discussing the two stocks above mentioned, namely *Eparietites* and the *sagittarium* group, and their relations to the true *Asteroceras* and *Arietites*—which last is represented in the Hull Museum material sent to me by forms referred to such widely known species as *Ammonites brooki* Sowerby and the *turneri-plotti* group—attention may be directed again to the incompleteness of our knowledge of the Yorkshire sequence.

The stratigraphical position of the various species of *Eparietites*, for example, requires investigation. Mr. Buckman in 1919⁴ put *Eparietites impendens* into the *stellare* (*denotatus*) zone; and a position at the limit of the old *oxynotum* and *obtusum* zones seems probable from a study of the sequence given in the following table, and the fact that one side of Wright's example of *Arietites denotatus* (Simpson), Pl. VI., fig. 1 (really *Eparietites fowleri* J. Buckman sp.⁵) from Cheltenham, not Yorkshire, is crowded with immature *Angulaticeras* (*lacmata* group). The table shows the subdivisions of the Oxynoticeratan and Asteroceratan ages, and links up the beds of the Deroceratan, listed previously (see *supra*, p. 169) with those of the Arietitan⁶ age below, including the post-*alcinoid* to post-*turneri* [= *turgescens*] horizons.⁷

¹ 'Genesis of the Arietidae.' Smithson. Contribut. 673 (1889).

² Spath, *Proc. Geol. Assoc.*, 1924, p. 205.

³ *Loc. cit.* (1882), pp. 355, 372.

⁴ 'Yorkshire Type Ammonites,' Vol. II. (1919), Pl. CXX.

⁵ See 'Pal. Universalis,' 1904, Pl. XXXVII.

⁶ Spath, 1924, p. 206 = 'Microderoceratan,' S. S. Buckman, 1925.

⁷ Spath, *Quart. Journ. Geol. Soc.* (1923), table to p. 84.

	Dorset.	Yorkshire.	Wurtemberg. ¹
Asteroceratan. { <i>lymense</i>	×	absent ?	absent ?
		[gap ?]	
{ <i>oxynotum</i>	} absent ?	×	<i>oxynotum</i>
{ <i>bifer</i>		?	<i>oxynotum</i> + <i>bifer</i>
{ <i>simpsoni</i>		?	<i>bifer</i>
{ <i>lacunatum</i>		×	<i>bifer</i> + <i>lacunatum</i>
{ <i>denotatus</i>		×	<i>lacunatum</i>
{ <i>ziphus</i> ?		×	} ' <i>planicosta</i> ' etc. beds (not subdivided)
{ <i>stellare</i>	×	} doubtful	
{ <i>landrioti</i>	×		
{ <i>planicosta</i>	×		
{ <i>obtusum</i>	×		
{ <i>capricornoides</i>	×		



FIG. 5.

Asteroceras blakei sp. nov., Lower Lias, Robin Hood's Bay (B. M. No. C19991). One of Blake's examples of *Arietites obtusus* (p. 287), referred to by G. C. Crick (*Naturalist*, 1922, p. 283.).

Now the Yorkshire species of *Eparietites* may not all come from the *denotatus* zone, and it seems to me that the *stellare* and *obtusum* zones in particular require investigation in the field. Blake's example of *Arietites stellaris* (already referred to by the late G. C. Crick in *The Naturalist*, 1922, p. 283) is a crushed *Ammonites* s.s. (*bisulcatus* group), and one of his *Arietites obtusus* is here figured as a new species of *Asteroceras* (*A. blakei* sp. nov., fig. 5) allied to and only

¹ After Frebold, 'Ueber Cyklische Meeres-Sedimentation.' Leipzig, 1925, p. 15.

more compressed and more closely costate than *Asteroceras smithi* J. de C. Sowerby sp.¹ Again the various large Yorkshire ammonites referred to *A. stellare*, such as the example figured by Mr. C. Thompson in *The Naturalist* (1910, Pl. XII., fig. 2), include not only forms probably of the group of *A. margarita* Parona,² but *Arietites* of an earlier age, and I have not seen any Yorkshire specimens that could be identified with either *A. stellare* or *A. obtusum*. Detailed collecting would thus be extremely useful, especially since *Eparnioceras* ('*semicostatus*' group) has now also been found by Dubar³ to be associated with *Ammonites* '*planicosta*,' the commonest ammonite of the Asteroceratan age. I formerly⁴ suggested that *Eparnioceras* may belong to the *birchi* zone, but it is possible that it will yet turn out to be of even *planicosta* age, with which species *Ep. flavum* S. Buckman, in any case, occurs. Whether the fifteen feet of *turneri* beds at the top of Tate and Blake's *bucklandi* zone correspond with the *turneri* horizon of the Dorset coast also remains to be seen. Mr. Buckman⁵ doubtfully put these beds into the *birchi* zone, but neither *Microderoceras birchi* itself nor the common *Arietites* of the *turneri-plotti* assemblage has been seen by the writer from Yorkshire, except in such immature, doubtful examples as those described below. Here is obviously a great opportunity for anyone desirous of investigating the reality of assumed non-sequences.

For the group of *Ægoceras sagittarium* Blake⁶ the new genus **Ægasteroceras** gen. nov.⁷ may be proposed. The typical form, with 20-24 ribs per whorl, as represented by the holotype (Sedgwick Museum) includes also Blake's fig. 2b (B. M. No. C17881) and the large example (B. M. No. C18040) recorded by Crick⁸; further Wright's Pl. LII., figs. 1-2 (B. M. No. C13124) of 235 mm. diameter, and his figs. 4-5 of Pl. LII. and figs. 3-4 of Pl. LIIA, which represent, rather incorrectly, the same individual (B. M. No. C1873). The second of Blake's examples of *Arietites obtusus* also belongs to the present species, as suggested already by Crick.⁹

Ammonites capricostatus Quenstedt¹⁰ appears to be identical

¹ 'Mineral Conchology,' Vol. IV. (1823), Pl. CCCCVI.

² 'Ammoniti del Lias inferiore del Saltrio,' *Mém. Soc. Pal. Suisse*, Vol. XXIII. (1886), p. 41, Pl. V., fig. 8.

³ 'Contribution à l'Etude du Lias de la Feuille de Mézières,' *Bull. Serv. Carte. Géol. France*, No. 152, Vol. XXVII. (1923), p. 20.

⁴ *Loc. cit.* (*Quart. Journ. Geol. Soc.*, 1923), p. 71.

⁵ In *Memoir 'Geology—Whitby and Scarborough'*, 2nd ed. (1915), p. 68.

⁶ In Tate and Blake, *loc. cit.* (1876), p. 276, Pl. VII., fig. 2a only.

⁷ Genotype: *Æ. simile*, sp. nov. = *Ægoceras sagittarium*, Wright, non Blake, Pl. LIIA, figs. 5-6 only, as represented by the example of which the suture-line is here figured, fig. 6a.

⁸ *Loc. cit.* (1922), p. 276.

⁹ *Ibid.*, p. 283.

¹⁰ *Loc. cit.* (1884), p. 145, Pl. XIX., fig. 14 (non 15).

with *Æ. sagittarium*. For the form depicted by Wright in Pl. LIIA., figs. 1-2 (B.M. No. C1922) the new name *Æ. crassum*, may be suggested. This is more coarsely and distantly ribbed and distinctly keeled, and its resemblance to *Wachneroceras latimontanum* Neumayr, seemed to Hyatt¹ to be a remarkably good example of morphological equivalence. Wright's specimen (B.M. No. C1875) of Pl. LIIA, fig. 6 may be transitional between *Æ. sagittarium* and *Æ. crassum*, and will probably have to be included in *Æ. acuticostatum* Wright.² Its whorl shape was depicted as too quadrate, for it agrees with that of Wright's fig. 2, Pl. XXXV.

The suture line of *Æ. acuticostatum* figured by Wright³ shows some agreement with that of the genotype *Æ. simile*

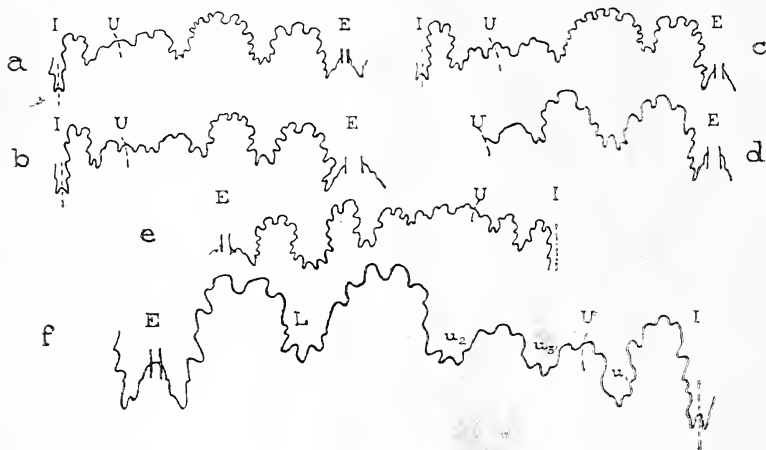


FIG. 6.

Suture lines of (a) *Ægasteroceras simile* gen. et sp. nov., genotype, holotype (L. F. S. No. 1874), Robin Hood's Bay, at diameter of 30 mm. (\times about 2); (b) *Asteroceras marstonense* sp. nov. (B. M. No. C17997), Marston Magna, at 17 mm. (\times about 3.5); (c) *Arietites* cf. *brookii* (J. Sowerby) Hull Museum (Drift) = *Ar. brooki* (Reynès) in C. Thompson, *Q. J. G. S.*, 1913, p. 180, at 25 mm. (\times about 3); (d) *Arietites brooki* (J. Sowerby), immature, Lyme Regis (W. D. Lang, Coll. 4455, bed 74d) at 20 mm. (last but one suture-line \times about 3.5); (e) *Slatterites slatteri* (Wright), B. M. No. C16953, Drake's Broughton, Worcestershire, at 30 mm. (\times about 2); (f) *Asteroceras obtusum* (J. Sowerby) from Wurtemberg at whorl height of 5.9 mm. (after Dietz, 1923, text-fig. 24, p. 428). Lobe formula: I U₁ U₃ U₂ L E (reduced $\frac{2}{3}$).

(Wright's fig. 5 of Pl. LIIA.) here represented (fig. 6a), in which, fortunately, the internal elements could also be exposed.

¹ *Loc. cit.* (1889), p. 201

² *Loc. cit.* (1880), p. 371, Pl. XXXV., figs. 1-3, 7.

³ *Loc. cit.* (1880), Pl. XXXV., fig. 7. The suture-line figured in 1882 (Pl. LII, fig. 3) said to be that of *Æ. sagittarium*, does not belong to any example of the present group.

The complete lobe lines of an *Asteroceras* of the group of *A. smithi* (J. de C. Sowerby) namely *A. marstonense* sp. nov. (text fig. 7),¹ and of a Wurtemberg example of *A. obtusum* (fig. 6f) after Dietz² are also figured for comparison, and it will be seen that they do not differ materially from the suture lines of *Arietites* of the *brooki* type, figured in text figs. 6 c and d. There is some resemblance of the *Ægasteroceras* to *Slatterites obtusiformis* Spath,³ with ribs opposite, which has

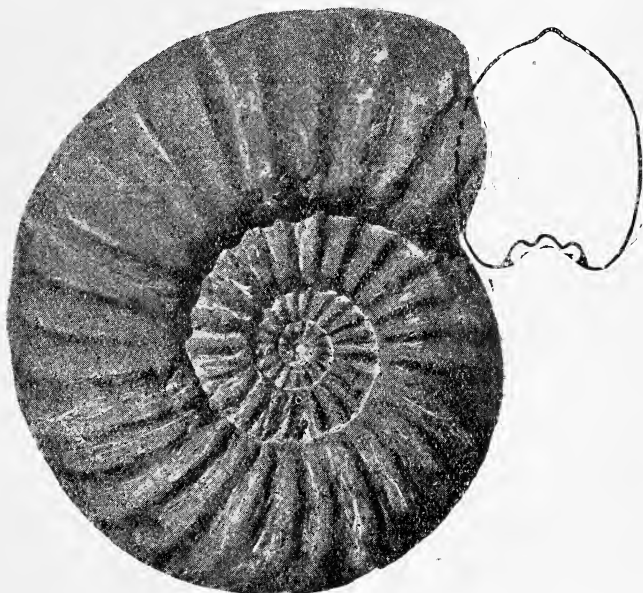


FIG. 7.

Asteroceras marstonense sp. nov., Lower Lias (Robin Hood's Bay ?), W. Bean Coll. (B. M. No. 37948).

often been mistaken for *Æ. sagittarium*. The suture line of *Slatterites slatteri* (fig. 6e) shews that its reference to the family *Oxynoticeratidæ*⁴ instead of *Arietidæ* is justifiable.

Comparison of the suture-line of *Ægasteroceras* with the very similar lobe-lines of *Asteroceras amblyptychus* or '*Ast. ptychogenos* Pompeckj'⁵=**Ptycharietites** gen. nov.⁶ may suggest

¹ The far more abundant, more closely costate, companion species of *A. smithi* in the Marston Stone, with 22-25 instead of 15 ribs. Both, with *A. blakei*, are transitional to *Ægasteroceras*.

² *Loc. cit.* (1923), text-fig. 24, p. 428.

³ See *supra*, p. 171.

⁴ To replace *Oxynotidæ* Hyatt, used in 1924 (Spath, *loc. cit.*, p. 206).

⁵ 'Neue Ammon. a. d. Unt. Lias v. Portugal.' *Zeitschr. Deutsche Geol. Ges.*, Vol. XLIX. (1897), p. 649, text-figs. 4-5, Pl. XXIII., figs. 3c-d.

⁶ Genotype: *A. ptychogenos* Pompeckj., *loc. cit.*, p. 643, Pl. XXIII., figs. 2a, b.

genetic connexion, but the Portuguese forms¹ are probably closer to *Eparietites*—which tends towards such discoidal forms as *Ep. choffati* Pompeckj sp.,² and does not return to an *Asteroceras* whorl-shape—and *Slatterites*, which loses the keel entirely. When the horizons of all these stocks are definitely known it is hoped to get good additional evidence for a final rejection of the views on ammonite development connected with the names of Hyatt and Württemberg.

It might be concluded from Blake's account that *Ægasteroceras* is of post-*stellare* date, and it appears actually to be connected, not with *Asteroceras* of the early *obtusus*³ group, but with the later *smithi* types by a perfect series of gradations. Of these one link is Young and Bird's *Ammonites redcarensis*,⁴ having the same number of ribs (15) as *Asteroceras smithi*, but a less pronounced keel, and referable to *Ægasteroceras*. Reynès's *Amm. retusus*,⁵ however, is still close to *Asteroceras obtusum*. Fiege's⁶ contention that *A. obtusum* and *A. stellare*, together with *Arietites brooki*, are merely variants of one group cannot be upheld in view of their stratigraphical position in the Dorset sequence. *Asteroceras* is probably the descendant of *Arietites* s.s., and there are various forms intermediate between *Ar. pseudobrooki* n. nov.⁷ and *Asteroceras bredonense* nov. The auriculoids of the inner whorls of *Asteroceras stellare* are coenogenetic, and do not indicate connexion with, e.g., the earlier *Euagassicerat*. But it would be interesting to discover whether the five Dorset horizons of the *Asteroceras* age are really developed on the Yorkshire coast. Not only is there no trace of *Epophioceras* (*landrioti* group), but *Ammonites scoresbyi* Simpson,⁸ if a *Xipheroceras* at all, is quite unlike any of the numerous Lyme forms of this genus. They include *X. dudressieri* d'Orbigny sp., as represented by Wright's Pl. XXIV., figs. 1, 2, 4, 5, one of which contains, in the same

¹ These include still another entirely new development, *Pompeckioceras* gen. nov., proposed for *Arietites* (*Arnioceras*?) *oncocephalus* Pompeckj. (*loc. cit.*, 1897, p. 654, Pl. XXIII., figs. 7a-c).

² 'Notes sur les *Oxynticeras* du Sinémurien Supérieur du Portugal, etc.' *Comm. Serv. Géol. Portugal*, Vol. VI. (1907), p. 228, Pl. I., figs. 2-5.

³ Wright's *Ar. obtusum* (non Sowerby, Pl. XXI., figs. 1, 2, B.M. No. C2222), is a distinct form with high and steep umbilical edge, and may be renamed *Asteroceras bredonense*, n. nov.

⁴ 'Geological Survey of the Yorkshire Coast,' 1822, p. 258, Pl. XIV., fig. 10.

⁵ *Loc. cit.* (1879), Pl. XXXVII., figs. 12-13 (lectotype).

⁶ 'Biostratigraphie der Arietenschichten Nordwestdeutschlands and Württembergs.' *Inaug. Dissert. Göttingen*, 1923, p. 58. B.M. No. C. 17505.

⁷ Like *Arietites* cf. *turgescens* S. Buckman in Wright, Pl. XII., figs. 1-3, but umbilicus = 33% of diameter.

⁸ See S. S. Buckman, 'Yorkshire Type Ammonites,' Vol. I. (1911), Pl. XXXIX.

block, an *Eparnioceras flavum* (S. Buckman), whereas another encloses various *Asteroceras* of the *stellare* type, with and without auriculoids. *Xipheroceras rasinodum* (Quenstedt), including Wright's Pl. XXV., also belongs to this assemblage, further *X. perplanicosta*, n. n. (Wright's Pl. XXIV., fig. 3 only = B.M. No. C2233), *X. ziphiforme* n. n. (=Wright's fig. 8 [and 6?] of the same plate), *X. perarmatum*, n. n. (=Wright's Pl. XXIV., fig. 7), and *X. æquicostatum* n. n. (=Reynès, *loc. cit.*, 1879, Pl. XL., figs. 15-16 = B.M. No. C3541).¹ The writer is now working out the *Xipheroceras* sequence as illustrated by the Dorset material collected by Dr. W. D. Lang, and it may suffice for the present to state that *X.* of the *ziphus* type, occurring in Yorkshire and also the Marston Stone, are absent in Dorset, and may thus well be of post-*stellare* date.

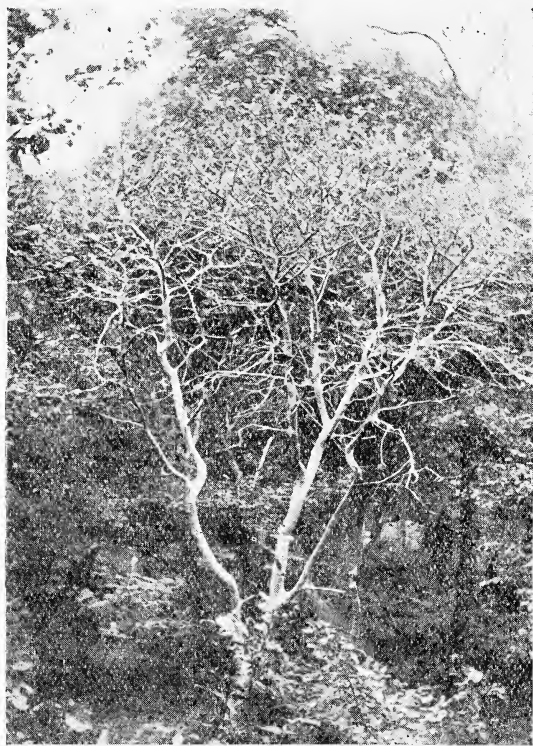
The *brooki-turneri*-like forms of *Arietites*, the suture-line of one of which is here figured (fig. 6c), were referred by Messrs. Thompson and Buckman to *Arietites brooki* (Reynès non Sowerby?) and *Ar. plotti* (Reynès). The latter species is more evolute than the Yorkshire form, which is certainly very similar to Reynès's *Amm. turneri*, though I have not seen any adult Yorkshire example that could be absolutely identified with Sowerby's species or its close ally *Ar. plotti*. The Hull Museum specimens are immature, but in straightness of costation and compression of the lateral areas are more closely comparable to Sowerby's type than to Reynès's *Amm. brooki* (especially Pl. XXXVII., figs. 1-2, of similar dimensions). Although Sowerby's *A. brooki* is less sharply costate on the inner whorls, the suture-line certainly is comparable, but identification with this form is also impossible. The somewhat similar example figured by Wright (Pl. XXIIA., fig. 4), if not actually the young of *Eparietites impendens* (Young and Bird), may be an immature form of the same genus, having not only a more prominent umbilical edge than *Arietites brooki*, but finely costate inner whorls.

Larger examples of *Ar. brooki* develop smooth outer whorls, and similar forms, retaining tricarination of the periphery, have been found in Yorkshire. These are thus true *Arietites*, not *Asteroceras stellare*, under which name they have generally been recorded. Only careful systematic collecting, however, will enable us to determine whether the lower horizons of the *obtusum* zone, in Oppel's sense, are developed on the Yorkshire coast in a manner similar to that of Dorset. It will be remembered that *Microderoceras birchi* also, most abundant just below *Arietites turneri*, appears to be scarce in Yorkshire.

¹ *Xipheroceras* ? **pseudoziphus** n. n. (= *Ammonites ziphus* Reynès, *pars.*, *loc. cit.*, 1879, Pl. XXXIX., figs. 8-9) has not yet been recognised in any British example.

FIELD NOTES.

Defoliation of 'Bird Cherry' in Yorkshire. — The accompanying photograph represents a 'Bird Cherry' tree, *Prunus Padus*, growing near Goathland, which I recently examined in company with Messrs. Frank Snowdon and James Patterson. The tree is about 20 feet high. All the leaves had been eaten, and the branches appeared as if they had been painted with a metallic enamel. On a closer examination



we found that a kind of cobweb had been spun all around the branches, and small caterpillars were crawling over the web. Specimens of these have been submitted to Mr. G. T. Porritt, who kept some of the larvæ, which on emerging proved to be, as he anticipated, *Yponomeuta evonymellus* Linn. = *Y. padi* Zell. He also reports that with them were numerous ichneumons, the name of which he will send later.—R. J. FLINTOFF, Goathland.

Large Clutch of Robin's Eggs.—This season I found a Robin's nest, which had been built in an old biscuit tin,

thrown into a bed of nettles. The nest contained six eggs. The bird incubated the eggs for a few days and then disappeared. I did not remove the eggs, and passing by some little time after I found an additional five eggs in the nest, obviously laid by another bird. This made eleven eggs in the nest, which the second bird was covering; in a few days she disappeared. There are a lot of rats in the neighbourhood, and no doubt both sitting birds were either destroyed or frightened away. All the eggs, afterwards, were gradually taken.—R. FORTUNE.

Young Common Seal in Filey Bay.—On July 23rd a young Common Seal came ashore near Hunmanby Gap. It was alive when captured, but died soon after. Its length was 40 inches. It had no sign of injury, and I fancy starvation was the cause of death. It must have wandered either from



the great nursery in the Wash or from the Farnes, where they occasionally breed. Or possibly it may have been born on a lonely stretch of sands on the Holderness coast.—R. FORTUNE.

Young Seal at Scarborough.—Since the above was written, another young Seal has been captured near the Royal Albert Drive at Scarboro'. It came in with the tide on August 12th, and was caught by a visitor, who pulled it out of the water. The animal threatened to bite, whereupon its captor released his hold, and the seal swam away. Several photographers were able to take snaps while the animal was held. It was estimated to weigh about 40 lbs.—R.F.*

Depressaria nervosa in South-west Yorkshire.—During the Yorkshire Naturalists' Union excursion to Coxley on June 25th, certain larvæ were found in abundance on plants of *Enanthe crocata* L. In common with the other entomologists I collected a supply, which have produced moths that Mr. G. T. Porritt identifies as *Depressaria nervosa*. Thus a

* A further specimen was seen at Kilnsea early in August.—Ed.

valuable record is established, as a result of the field-day.—CHARLES MOSLEY, Huddersfield.

D. nervosa is widely distributed in Britain, but in Yorkshire had only previously been recorded from Scarborough.—G.T.P.

Mammoth Tooth in Holderness Boulder Clay.—While walking on the beach at Aldbrough I noticed protruding from the tough purple boulder clay, and firmly embedded in it, a small mammoth tooth to which portions of the jaw-bone were still attached. The precise position is about 350 yards north of the Inn, and the depth was about 50 feet from the surface. There is no doubt about the position of the tooth being actually in the clay in the same way as the other boulders. Its weight is 2 lbs. 14 ozs.—R. W. LAMB, Hull.

Bronze-Age Beaker from South Cave, E. Yorks.—During excavations at South Cave recently, a human skeleton, with a prehistoric vessel, were discovered, the remains of which have been placed in the Museum at Hull, but unfortunately the objects have suffered from the zeal of souvenir hunters. The parts preserved show distinctly that the vessel is one of the 'beakers,' or drinking cups, of the Bronze Age, and would originally be about 7 ins. in height and 4 ins. in width, the whole of the outer surface being decorated by a punctured cord-like series of encircling lines, with, in parts, diagonal incisions giving a triangular ornamentation to zones of the vessel.—T. SHEPPARD.

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Lobo, by E. T. Seton. 125 pp., 2/6 net. This is a series of stories taken from the author's 'Wild Animals I have Known.' The chapters refer to 'Lobo: the King of the Currumpaw'; 'Silverspot, the Story of a Crow'; 'Redruff, the Story of the Don Valley [Toronto] Partridge,' and 'Bingo, the Story of My Dog.' Mr. Seton is fond of his dogs, and tells us so.

Concerning the Habits of Insects, by F. Balfour-Browne. London: Cambridge University Press, 169 pp., 6/- net. Professor Balfour-Browne, the well-known Zoologist, delivered a series of lectures at the Royal Institution last year, respecting which there was much favourable press comment made at the time. These lectures deal with Insect Collecting and what it may lead to, The Habits of Bees and Wasps, of Caterpillars, of the Dragonfly, the Water-beetle, and of Insects and the Work of Man. The volume is well illustrated.

A Dictionary of the Flowering Plants and Ferns, by J. C. Willis. London: Cambridge University Press, 727 pp., 20/- net. We have pleasure in drawing attention to the fact that the compact and invaluable Dictionary of the Flowering Plants and Ferns, by Dr. J. C. Willis, has reached a fifth edition. The Dictionary in its present form is in one alphabet, and not only is there the dictionary of plants, particulars of the families, popular names, technical terms, etc., but there is also a key to the family of flowering plants based on Engler's classification as given in *Die Natürlichen pflanzenfamilien*, and revised in his *Syllabus*, Ed. 7.

"THE MATRON," FLAMBOROUGH HEAD.

T. SHEPPARD, M.Sc., F.G.S.

IN *The Naturalist* for October, 1923, attention was drawn to the fact that during the previous winter 'The King,' a well known feature off Flamborough Headland, had lost a leg, and the portion remaining seemed top-heavy. While endeavouring to ascertain when this occurred, it was discovered that another well known feature, off 'High Stacks,' 'The Matron' had disappeared, apparently some time ago, but none had noted its absence. After searching through hundreds



"The Matron," Flamborough.

of photographs and engravings, we appealed for a view of 'The Matron' in order to publish it as a record, and to show the nature of the coast changes even in a hard rocky promontory.

We have recently found an excellent illustration by no less an artist and naturalist than John Phillips, our greatest Yorkshire geologist. The illustration occurs on Plate XXIII. of his well known work on 'The Rivers, Mountains and Sea Coast of Yorkshire,' published in 1851. This we reproduce herewith. It was put 'on stone by W. Bevan from a sketch by J. Phillips,' and printed by 'W. Monkhouse, Lith., York.'

Phillips' description of this plate is as follows: 'The detached pinnacles of chalk at Flamborough are the last remains of the land which has been wasted; the caverns in the

cliff are the first great step towards further decay. For these caves are enlarged upwards continually by the falling in of the roof, till at length the outer walls stand detached, and appear as insulated rocks. Through how many long periods of years has the waste of the Flamborough Cliffs been continued.'

Phillips' next plate is of 'The King and Queen, Flamborough,' and while only a part of 'The King' is shown, it clearly indicates, on comparing with the photographs on Plate V. of *The Naturalist* for 1923, that changes had taken place between Phillips' time and ours.

His description of this plate is particularly happy: 'These rocks probably formed part of the outer wall of a cave worked long ages since into the solid chalk. An interesting gift to posterity would be a photographic picture of the detached rocks of Flamborough, taken from given points, which could readily be found again, so that comparative pictures could be made after the lapse of years, and the exact rate of decay be ascertained.'

Phillips' own pencilling in his sketch of 'The Matron' has given to posterity that which no camera appears to have recorded, and though our old friend Mr. Godfrey Bingley has secured and preserved a wonderful series of photographs of the Yorkshire coastal features, a set of which is in the Leeds University and may have been reproduced in numerous text books, not a single photograph of 'The Matron' appears to have been taken.

Quite recently, on visiting High Stacks at low tide, the stool upon which 'The Matron' sat was plainly visible, its top having sharp edges still unaffected by denudation, and except for a few periwinkles and limpets, uncovered by marine life; and between it and the cliffs was an accumulation of angular masses of chalk, as yet showing few effects of beach action, clearly the débris of 'The Matron.'

Yet notwithstanding its enormous size and prominence, none seem to know how and when it disappeared.

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Under the auspices of the London County Council a series of pamphlets is being issued explaining what the Council does in London. One of these deals with 'London Parks and Open Spaces' (London: Hodder & Stoughton, 115 pp., 1/- net). It is attractively printed on good paper, there are numerous illustrations, and a plan.

The National Museum of Wales continues to issue its remarkably cheap and useful publications, the latest to hand being on *The Slates of Wales*, by Dr. F. J. North (66 pp., 6d.). In this well-printed and well-illustrated handbook the history of the important slate industry of Wales is traced, geological information is given in an entertaining way, and there are illustrations of the manufacture of slates from the quarry to the builder.

In Memoriam.

BAKER HUDSON.

WE regret to record the death of Mr. Baker Hudson in his seventy-first year. He had taken a prominent part in the intellectual life of Middlesbrough. Mr. Baker Hudson was appointed Librarian at Middlesbrough thirty-six years ago.



He was one of the few original members of the Cleveland Naturalists' Field Club, of which at one time he was Secretary, and later an Honorary Member. He was specially interested in conchology, and many of his notes on that subject appear in the earlier volumes of *The Naturalist*. He was the first Curator of the Dorman Museum, Middlesbrough, from its inception in 1904 to the autumn of 1923, when he resigned the position, and Mr. F. Elgee took his place. He was also associated with the early days of the Middlesbrough Museum, when it was under the care of Dr. Veitch, this being long before the present building was erected. He was a prominent member of the Cleveland Sketching Club, and filled most of the offices in connection therewith. He was an early member of

the Yorkshire Naturalists' Union, and Secretary to the Conchological Section in 1888. He contributed notes on the Land and Fresh-water Shells of Middlesbrough to *Science Gossip* in 1883-1884. He leaves a widow and four sons, to whom we tender every sympathy.—T.S.

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The Twentieth Annual Report of the Manx Museum and Ancient Monuments Trustees is an excellent record, very well produced. There are illustrations of recent archaeological discoveries, the Manx Swords of State, etc., and a valuable 'Report on [Bird] Migration, 1924.'

The Society of Antiquaries of Newcastle-upon-Tyne has issued a General Index to *Archæologia Aeliana* and to the *Proceedings* of the Society, being the publications of the Society from A.D. 1895 to A.D. 1924—a valuable volume to those interested in the antiquities of the North.

The Transactions of the Lancashire and Cheshire Antiquarian Society, Volume XL., for 1922-3, issued 1925, contains, among other papers, 'The Preservation of Ancient Monuments,' by J. Swarbrick; 'Stone Implements Found at Winton, Eccles,' by J. J. Phelps, and 'The Sequence and Purpose of the Roman Forts at Castleshaw,' by I. A. Richmond.

We are glad to see from No. 6 of *The Proceedings of the St. Peter's School Scientific Society, York*, that this Society has a goodly number of enthusiastic members and friends. The pamphlet contains a useful record of work accomplished, upon which we should like to congratulate the editor and other officers. There is a good record of a successful exhibition, and useful meteorological and other notes.

G. W. Shirley edits the valuable *Transactions and Journal of Proceedings of the Dumfriesshire and Galloway Natural History and Antiquarian Society*, Vol. X. of the third series of which has recently been issued. The papers principally interesting to our readers are 'Woodland Life: Destruction of the Dead and its Bearings on Evolution,' by G. F. Scott Elliot, 'The Early Crosses of Galloway,' by W. G. Collingwood, and 'Notes on the Development of the Scottish County House,' by G. P. H. Watson. There are several beautiful coloured plates.

Vol. XXIX. of *The Transactions of the Institute of Water Engineers*, edited by A. Valon, contains the Presidential Address of John Chisholm, of Airdrie; 'Water Power at Greenock,' by J. MacAlister; 'On the Variation of the Consumption of Water in Towns,' by J. Bowman; 'The Preparation of a Rainfall Map of the British Isles,' by M. de Carle S. Salter; 'Fluctuations of Annual Rainfall,' by J. Glasspoole, and 'The Biology of Jersey Waterworks,' by W. Rushton, P. A. Aubin and A. J. Jenkins, the last containing a remarkable list of the fauna and flora. There is an appreciative obituary notice of the late W. Whitaker, 'a distinguished honorary member,' by W. Matthews, with portrait.

A substantial volume of the *Proceedings of the South London Entomological and Natural History Society* for 1924-25 (xix.+142 pp., 12/6) has been sent to us by Mr. Robert Adkin, who has had much to do with the valuable contents. The publication is well illustrated by plates, and among the many valuable contributions are 'Caudal Lamellæ of the Naiads of the British Zygopterid Dragonflies,' by W. J. Lucas; 'Some phases of the Parallel Variation in the British Lepidoptera,' by R. Adkins; 'The Romance of Helminthology,' by H. A. Bayliss; 'Entomology, Ancient and Present Day,' by R. Adkin; 'Flies and Disease,' by H. W. Andrews; 'Seasonal Variation in Butterflies,' by N. D. Riley, etc.

THE GEOLOGY AND NATURAL HISTORY OF MALHAM.

W. H. PEARSALL, D.SC., F.L.S., AND F. A. MASON, F.R.M.S.

MALHAM has twice previously been visited by the Union, but not under such weather conditions as characterized the 323rd meeting, held during Bank Holiday week-end, August 1st-3rd, 1925. The press report headline, 'Hampered by Rain,' only mildly expressed the situation, and as a good deal about the weather has been deleted from the notes contributed by Section leaders, it is only fair to point out that that headline applies to each of them.

Although the order of programme varied from that detailed in the circular, all the localities scheduled for examination were visited, with extension to Pike Daw, where Miss M. A. Johnstone, B.Sc., and Mr. A. E. Winter, B.Sc., did some useful collecting.

The Tarn Moss was only very imperfectly examined, and those who set out with the best of intentions, got little further than a shepherd's hut on the moor near by, in which a past-President of the Union had considerably kindled a fire. With the help of other Executive officers this was kept going for the next two hours, during which garments were desiccated and lunch partaken of, after which progress towards the Tarn was ventured upon.

A General Meeting was held at Headquarters on Monday evening, over which Mr. H. H. Booth presided. Votes of thanks were unanimously accorded to the Local Secretary, Mr. Riley Fortune, and to Major Morrison, D.S.O., for his kindness in permitting access to his estates.

GEOLOGY (W. S. Bisat, F.G.S.):—The geologists examined the exposures of knoll reef limestone on Cawden and Wedber, and in addition to noting the variety and abundance of the brachiopod and coral fauna at certain positions on the two hills, were successful in locating numerous goniatite-yielding blocks in the walls in two strictly localized areas, one on the south side of Cawden, and the other on Wedber Brow. These blocks of limestone containing goniatites are apparently the remnants of two 'pockets' of goniatites, one on each hill. The one on Wedber is evidently the source of the *Goniatites crenistria* referred to by Prof. Garwood and Miss Goodyear (*Q.J.G.S.*, Vol. LXXX., p. 234, 1924), and on the present occasion numerous specimens of this goniatite were extracted, the bulk being of a variety approaching *G. striatus*. The general shape, character of ornament and sutures shewed marked uniformity in these specimens.

The blocks on Cawden yielded several examples of a globose form of *G. crenistria*, apparently intermediate in character between the typical form and the variety *involutus* (De Kon.). In this form the spherical shape of the adolescent conch is reminiscent of *G. sphericus* (Mart.), but the Cawden variety differs from that species, and from *G. fimbriatus* (F. and C.) in both suture line and umbilicus. In association with the above species was found one specimen each of *Brancoceras ornatissimum* (De Kon.) and *Prolecanites* (or *Pronorites*) sp. The former is a fine species of a genus new to Yorkshire, previously known only from one specimen from Ireland, and the solitary representative in Viséan time of a Devonian and Tournaisian genus. A very large brachiopod, gastropod and lamellibranch fauna, is associated with the goniatites.

An outcrop of knoll limestone, half a mile south of Malham, on the left bank of the River Aire, mentioned by Garwood and Goodyear (*op. cit.*, p. 234) as having yielded *G. crenistria*, was found to be exceptionally fossiliferous, and deserves detailed examination. There are at least three goniatite-yielding bands in it, one near the base of the exposure containing *G. crenistria* and possibly another species, a second band

about 15 feet higher containing *G. crenistria* and *Beyrichoceratoides implicatum* (compressed form), and a third band (probably the highest) containing *G. striatus* (variety figured by Phillips) and numerous *Nomis-moceras* aff. *vittiger*, in a crystalline encrinital limestone, associated with a varied molluscan fauna. Two trilobite tails were found in this band, and in the upper *crenistria* band Miss Johnstone obtained a fine *Proboscidiella*.

The *Homoceras malhamense* band in the Bordley Shales at the head of Moor Close Gill was again examined. Further down stream, specimens of another goniatite near *Eumorphoceras pseudobilingue* were collected by Mr. Holmes on a previous visit, and go some way towards confirming the ascription of these shales to the Bowland Shales, as made by previous writers.

Beyrichoceratoides castletonense, which was expected to turn up in the Malham area, was not detected.

Miss Johnstone and Mr. Winter found trilobites in fair profusion in the limestone near the lead mine on Pike Daw, perhaps from the same band which yielded *Phillipsia seminifera* (Phill.) to Garwood and Goodyear (*op. cit.*, p. 223). The fairly frequent occurrence of trilobites serves to direct attention to a group of organisms which, so far as the Carboniferous rocks are concerned, have been very much neglected.

It is evident that careful collecting and recording of the exact position of the goniatite-yielding 'pockets' in the knolls both at Malham and Cracoe is required, in order to ascertain the exact succession in time of the *crenistria* and *striatus* gens, and subsequently to elucidate the true structure of the knolls. The fauna, especially the brachiopods, associated with the goniatites, should also be recorded for correlation with the Yoredales.

The writer would be glad to examine any knoll goniatites, especially where the locality is known.

VERTEBRATE SECTION (H. B. Booth):—BIRDS.—On the moor were Curlews, Redshanks, Golden Plovers, Lapwings, Red Grouse, Partridges, Carrion Crows, and pairs of Wheatears every hundred yards or so.

At the Tarn were Tufted Ducks, Mallard, Teal, Coots, Waterhens, Great Crested and Little Grebes, and Common Sandpipers. Three species of sea-gull were present, viz., Black-headed and Lesser Black-backed (most in the last year of immaturity) and one adult Herring Gull. Many more Sand Martins were flying about over the Tarn than I have noticed previously, and the head gamekeeper (Mr. Ward) informed me that they nested in the peat banks of the adjoining 'Moss.' Two pairs of Great Crested Grebes have again nested this season, one pair being followed by one youngster, and the other pair had three, three-parts grown. These last caused much amusement by spending most of their time in chasing their father every time that he appeared on the surface. He in turn lost no time in diving to avoid them, as he did not appear to be able to secure any fish for them.

In the valley among other birds noted were the Dipper, Kingfisher, Kestrel, Sparrow Hawk, Grey, Yellow and Pied Wagtails.

MAMMALS.—A large male Stoat was watched for several minutes, and a Mole was picked up dead on the moor. On another part was a rabbit warren containing a good number of black rabbits. It was pointed out what a disadvantage to the individuals this 'sport' or variation was, as they were visible at more than twice the distance their immediate neighbours of normal shade were.

BOTANY (W. H. Pearsall):—It is particularly gratifying to record, from an area so well known to botanists as Malham, a species which has not previously been observed in that district. Examining the pond-weeds washed up along the edge of the Tarn, we obtained a piece of *Potamogeton angustifolius* (*P. Zizii*), one of the less common species usually confined to the larger lakes. In addition to this, there were

P. perfoliatus, *P. prælongus* and *P. lucens*, the last accompanied by its variety *acuminatus*, which has not been previously recorded for Malham Tarn. The edge of the Tarn Moss was also remarkable for an abundance of *Carex disticha*. None of the rare Carices was seen, but the weather precluded any detailed examination of the vegetation. The Saturday excursion was devoted largely to the valley above Gordale. On the cliffs, *Origanum vulgare* was seen, as well as a number of curious forms of *Thalictrum minus*. The flushes and marshes, higher up the valley, proved very interesting, although they yielded few rarities. Here were obtained *Bartsia alpina* and the curious purple-lipped form of *Rhinanthus* described by Mr. Bradley. *Scirpus compressus* and *S. pauciflorus* were also obtained, and an unusual feature in such flushes was the presence of tufts of *Festuca elatior*. *Selaginella* and a long list of the common Carices were found as expected, along with *Antennaria dioica*. The following species were also obtained during the excursion:—*Geranium sanguineum*, *Actæa spicata*, *Draba muralis* and *Sedum Rhodiola*. A search was made for both *Hutchinsia petraea* and *Carex capillaris* without success.

ENTOMOLOGY (J. M. Brown, B.Sc.):—The work of the Entomological Section was very much interfered with by the wet weather, there being only one day conducive to activity among insects. Collections were made in some of the orders so far as conditions would allow, resulting in the addition of two new Homoptera to the county list.

COLLEMBOLA.

The wet state of the ground and of the vegetation prevented much being done in this order, only six different forms being noted.

<i>Tomocerus minor</i> Lubbo.	<i>Sminthurus viridis</i> L.
<i>Orchesella cincta</i> L. and v. <i>vaga</i> L.	<i>Bourletiella bicinctus</i> var. <i>repanda</i> Agr.
<i>Entomobrya nivalis</i> L.	

HEMIPTERA.—*Heteroptera* were very scarce, partly due, most probably, to the scarcity of woodlands in the district, but the smaller *Homoptera* were plentiful in the grass and among low vegetation. Monday's storm prevented the expected search for the less common bog-loving species in the Malham Tarn Moss.

The following species were taken. * = New to the County.

HETEROPTERA.

<i>Nabis limbatus</i> Dahlb.	<i>Calocoris sex-guttatus</i> F.
<i>Anthocoris confusus</i> Reut.	<i>Lygus pabulinus</i> L.
<i>A. nemorum</i> L.	<i>Capsus (Rhopalotomus) ater</i> L.
<i>A. nemoralis</i> F.	<i>Mecomma ambulans</i> Fall.
<i>Stenodema holsatum</i> F.	<i>Velia currens</i> F.
<i>Trigonotylus ruficornis</i> Geoff.	

HOMOPTERA.

<i>Philænus spumarius</i> L. in several varieties.	<i>Deltocephalus pulicaris</i> Fall.
<i>P. lineatus</i> L.	<i>Athysanus brevipennis</i> Kbm.
<i>P. exclamationis</i> Thumb.	<i>Limotettix persimilis</i> Edw.
<i>Acocephalus albifrons</i> L.	* <i>L. lunulifrons</i> J. Sahlb.
<i>A. bifasciatus</i> L.	<i>L. sulphurella</i> Zet.
<i>Deltocephalus abdominalis</i> Fab.	<i>Cicadula sex-notata</i> Fall.
<i>D. pascuellus</i> Fall.	<i>Dicranewra similis</i> Edw.
* <i>D. cephalotes</i> H. S.	<i>Eupteryx vittatus</i> L.
<i>D. ocellaris</i> Fall.	<i>Typhlocyba ulmi</i> L.
<i>D. punctum</i> Flor.	<i>Conomelus limbatus</i> Fab.
<i>D. flori</i> Fieb.	<i>Dicranotropis hamata</i> Boh.
<i>D. distinguendus</i> Flor.	<i>Psylla peregrina</i> Först.

The gall due to *Livia juncorum* Latr. was noted, but the insect was not seen.

MOLLUSCA (Greevz Fysher) :—Land snails were seen in abundance. Many slugs were also observed, but they were not so numerous in proportion as in many other localities lately visited by the Union.

The Tarn was only examined close to the outflow of the river. The form of *stagnalis* in the Tarn is under the average size and slender. Mr. Taylor's Monograph, p. 83, contains the following note upon this species from the locality :—

'In Malham Tarn, a large body of water upon an elevated plateau, 1,250 feet above the sea, in the West Yorkshire Highlands, Mr. W. Denison Roebuck and Mr. J. Darker Butterell, in September, 1883, collected numerous specimens of *Limnæa stagnalis*, which I found clearly to reflect the low temperature and the thermometric vicissitudes of the lake by a shell of great comparative delicacy and small size, with the many growth-checks strongly emphasized by the whitish transverse thickenings crossing the whorls and showing that part of the shell-forming energy has evidently been here diverted to more vital purposes. Other specimens obtained during August, 1890, from the same place, did not exhibit any striking diversity from ordinary examples, and this was probably owing to the active growth-periods being during comparatively mild and favourable weather.'

The following is a list of species identified by Mr. John W. Taylor, M.Sc. :—

OUTSIDE VICTORIA CAVE, SETTLE.

Helix nemoralis var. *libellula*, common, formulæ 12345, 10345, (123)(45), 123(45).

GORDALE BECK.

Limnæa peregra var. *boissyi*.

BUCK HOTEL GARDEN.

Limax maximus.

MALHAM.

Hygromia striolata, *Helicigona arbustorum* and vars. *cincta* and *flavescens*.

MALHAM COVE.

Pupa umbilicata, *Clausilia bidentata*, *Clausilia cravenensis*, *Azeca tridens* and var. *nouletiana*, *Zua lubrica* and var. *alba*, *Vitrina pellucida*, *Arion ater*, *A. circumscriptus*, *Hyalinia cellaria*, *H. nitidula*, *H. radiatula*, *Hygromia hispida*, *H. striolata* and var. *alba*, *Pyramidula rotundata*, *P. rupestris*.

MALHAM TARN.

Limnæa stagnalis var. *fragilis*.

JANET'S FOSS BECK.

Helicigona arbustorum and vars. *flavescens*, *cincta* and *fuscescens*, *Helix nemoralis* var. *libellula* 00000, *Hygromia hispida*, *H. striolata* and var. *alba*, *Pyramidula rotundata*, *Arion subfuscus*, *Hyalinia alliaria*, *Clausilia bidentata*, *C. cravenensis*, *Succinea putris*, *S. elegans*, *Limnæa peregra*, *L. truncatula*, *Pisidium pusillum*.

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YORKSHIRE NATURALISTS AT FLAMBOROUGH.

W. H. PEARSALL, D.SC., F.L.S., AND F. A. MASON, F.R.M.S.

SATURDAY, July 11th, was the date of the 322nd meeting of the Yorkshire Naturalists' Union, which was held at Bridlington for the further examination of the cliffs near Flamborough Head. While the geologists and zoologists confined themselves largely to these cliffs, the botanists went further afield and also visited the Danes' Dyke. The President, Professor J. H. Priestley, D.S.O., occupied the chair at the evening meeting in Bridlington, and after the customary reports, votes of thanks

were unanimously tendered to Messrs. R. J. Flintoff and W. S. Bisat for their services as leaders and also in making the local arrangements.

GEOLOGY (W. S. Bisat) :—The cliff sections of the pre-glacial buried beach at Sewerby proved to be unusually clear, and the three divisions of the pre-glacial deposits into a basal beach of rounded chalk pebbles overlain by windblown sand, which in its turn was covered by a chalk grut, were easily discernible. Further north, between Sewerby and Danes' Dyke, the top of the chalk cliffs was seen to be eroded downwards for several feet, and a shallow valley filled in with a breccia overlain by glacial deposits.

VERTEBRATE ZOOLOGY (H. B. Booth) :—The ornithologists spent practically their whole time on the cliff tops, which were carefully worked from the lighthouse at Flamborough to Speeton. Good views were obtained of the teeming populations of breeding sea-birds. The Guillemots are reported to be decreasing, but they are still in great abundance, and there are yet some vacant ledges. The nesting Kittiwakes are increasing in vast numbers—far beyond any possible estimate—and naturally are occupying ledges formerly used by Guillemots. Herring Gulls are increasing slowly, to the detriment of the other species, the eggs and tender young of which they steal and devour.

Mr. E. W. Wade reported that a pair of Cormorants had a nest and young near the King and Queen Rocks at Flamborough. The pair of old birds was seen, and also two or three immature Shags. A pair of Gannets had built a big nest on Black Shelf at Bempton, but Hodgson (the head of the climbing gang there) informed us that no egg was laid up to the last time of going down, viz., a fortnight before, and we did not see the birds. The Fulmar Petrel is not increasing as a breeding species as quickly as was expected. Only thirty to forty brooding birds could be located (doubtless a few others were in positions where it was impossible to see them); one was observed to be feeding a young chick of less than a week old.

Other species noted included Razorbills, Puffins, Kestrels, Carrion Crows, Jackdaws, House Martins, Rock Doves and other pigeons, and Tree Sparrows. All the Pipits that were critically examined on the cliff tops proved to be Meadow Pipits. No Peregrine Falcons were seen, and it was early in evidence, by the fearlessness of the pigeons and doves, that none was about. The abundance and cheerfulness of the Common Linnet (more especially in Danes' Dyke) was a very pleasurable feature to visitors from the West Riding. Nothing was noted of special interest in any other section of Vertebrate Zoology; but it was interesting to watch the numbers of Rabbits (old and young) running about on the very edge of the cliffs and on the brink of a huge precipice.

MOLLUSCA (Greevz Fysher) :—The very bright dry weather had the usual effect of sending most of the terrestrial Mollusca into hiding, but on the Belvedere Estate, Hilderthorpe, near Bridlington, on a bright sunny morning, *Helix aspersa* was very plentiful on nettles and other large weeds. This may have been owing to some moisture precipitated by mist or heavy dew at night. *H. nemoralis* v. *libellula* 12345 was also observed.

On Bempton Cliffs on Sunday, the following five *Helices* were observed :—*H. hortensis* var. *lutea* 12345, *H. aspersa*, *H. virgata* juv., *H. arbustorum* juv., *H. striolata*.

In the Gipsy Race near Bridlington, no aquatic mollusca could be obtained; the current seemed too strong for these slow moving animals.

FLOWERING PLANTS (R. J. Flintoff) :—Members interested in the flowering plants spent a most enjoyable and interesting day exploring Danes' Dyke, and the cliffs and fields from Cat Nab to the North Landing at Flamborough, a route suggested by Mr. J. Fraser Robinson, whose unavoidable absence caused many expressions of regret. We were

fortunate in having the valuable assistance of Professor Priestley and Miss Scott.

The list of the local wild flowers now numbers about 550 species, and all doubtful identifications have been either confirmed or corrected by recognised authorities, which makes the record of no small value. But the grasses have been somewhat neglected. Therefore, it is not surprising that among the many identified by Miss Scott the following are quite new to the list: *Holcus mollis*, *Bromus giganteus*, *Avena flavescens*, *Bromus mollis*, *Lolium italicum* and *Brachypodium sylvaticum*.

The ramble began at the southern end of the Dyke, where it is crossed by the Flamborough Road. On the eastern embankment we noted *Senecio sylvaticus*, *S. crucifolius* and *Rubus cæsius* in flower. *Cytisus scoparius* is plentiful, and some of the shrubs were still blooming.

In the Dyke ravine, *Orchis maculata* grows plentifully, and we saw specimens which varied greatly. Mr. W. A. Sledge gathered *Orchis Fuchsii* Dr., and *O. prætermissa* Dr., and also, on the cliffs, *Anthyllus vulneraria* var. *maritima*. Professor Priestley identified *Populus tremula* and *Prunus domestica*. Several fine specimens of *Conium maculatum* were seen, and *Potamogeton polygonifolius* proved the most abundant plant in a small pond. Nearby *Carex hirta* was obtained. In the fields near the cliff we found *Euphorbia exigua*, *Alchemilla arvensis* and *Lycopsis arvensis* in flower.

Mr. Greevz Fysher reported plentiful growths of *Hyoscyamus niger* in flower on the cliffs at Sewerby, and, I think, this would be the most uncommon plant recorded on Saturday. Several members remained at Bridlington for the night, and on Sunday the cliffs from Speeton to Bempton were investigated. Again many plants were found, *Rosa villosa* and the five plantains, fine specimens of *Plantago maritima* being in flower. I believe we saw *Matricaria inodora* var. *maritima* flowering on the ledges and slopes on the face of the cliff. But I give this identification with diffidence as we had to use the glasses to make a careful observation, the plant being far beyond our reach. J. F. Robinson, however, in his 'Flora of the East Riding,' records this plant along this part of the coast. Perhaps the most notable plant was *Orchis pyramidalis*. It was very gratifying to discover a few examples of this handsome flower growing in the grass at the cliff's edge, not because it is a rare plant at Flamborough—for it occurs here in other places—but because it is generally devastated either by the well-known acquisitive individual who gathers flowers without mercy to crush them into an ugly vase, or by the very common type of person who does so to satisfy a desire for wilful destruction.

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ENTOMOLOGISTS AT ASKHAM BOG.

W. D. HINCKS AND T. B. KITCHEN.

ON June 20th, by kind permission of Col. Wilkinson, of York, the members of the Entomological Section of the Yorkshire Naturalists' Union visited Askham Bog.

The bogs have been very well worked by entomologists; nevertheless two insects new to our county lists were found, together with several species hitherto unrecorded from the bogs. The main party met at Dringhouses car terminus at 3 o'clock and proceeded to the bog, where it was met by those members who had entered the bog earlier. The sun was not out for a sufficient length of time to awaken into activity the breeze flies so annoying at Askham, and few members were troubled by their 'bites.'

The following lists of captures have been kindly sent by the gentlemen named.

Naturalist

Mr. Cheetham records the following :—

DIPTERA.

<i>Macrocera vittata</i> Mg.	<i>Dolichopus unguatus</i> L.
<i>Corethra plumicornis</i> F.=	<i>D. simplex</i> Mg.
<i>Chaoborus crystallinus</i> Deg.	<i>Argyra leucocephala</i> Mg.
<i>Ochlerotatus Waterhouse's</i> Theob.	<i>Theriopterus montanus</i> Mg.
<i>Tæniorkynchus richiardi</i> Fic.	<i>Chloromyia formosa</i> Scop.
<i>Dicranomyia modesta</i> Mg.	<i>Callimya speciosa</i> Mg.
<i>D. mitis</i> Mg.	<i>Ascia floralis</i> Mg.
<i>Symplecta stictica</i> Mg.	<i>A. geniculata</i> Mg.
<i>Limnophila dispar</i> Mg.	<i>Helophilus lineatus</i> F.
<i>L. fulvonervosa</i> .	<i>Poliates albolineata</i> Flin.
<i>Limnobia quadrinotata</i> Mg.	<i>Caricea intermedia</i> Flin.
<i>Ptychoptera contaminata</i> L.	<i>Homalomyia serena</i> Flin.
<i>P. minuta</i> .	<i>Siphona geniculata</i> Deg.
<i>Erioptera tæniotota</i> Mg.	<i>Trichopterus punctipes</i> Mg.
<i>Pachyrrhina lineata</i> .	<i>Limnia unguicornis</i> Scop.
<i>P. quadrifaria</i> Mg.	<i>Tetanocera elata</i> F.
<i>Prionoceras turcica</i> .	<i>T. robusta</i> Lw.
<i>Empis stercorea</i> L.	<i>Pherbina coryleti</i> .
<i>E. livida</i> L.	<i>Nemopoda cylindrica</i> F.
<i>Hybos femoratus</i> Müll.	<i>Sepsis punctum</i> F.
<i>Clinocera stagnalis</i> Hal.	<i>S. nigripes</i> Mg.
<i>Ardoptera irrorata</i> Flin.	<i>Scatella stagnalis</i> Flin.
<i>A. guttata</i> Hal.	<i>Parhydra fossarum</i> Hal.
<i>Campsicnemus scambus</i> Flin.	<i>Notiphila cinerea</i> Flin.
<i>Dolichopus brevipennis</i> Mg.	

Mr. M. L. Thompson sends us the following records :—

COLEOPTERA.

<i>Agonum gracile</i> Gyll.	<i>Anisosticta 19-punctata</i> L.
<i>Philonthus ventralis</i> Grav.	<i>Cyphon padi</i> L.
<i>P. micans</i> Grav.	* <i>Galerucella lineola</i> F.
<i>Antherophagus pallens</i> Ol.	

HEMIPTERA-HETEROPTERA.

<i>Miris calcaratus</i> Fall.	<i>Psallus ambiguus</i> Fall.
<i>Plesiocoris tugicollis</i> Fall.	<i>P. betuleti</i> Fall.

Mr. J. M. Brown writes that very little was found in the bogs, those insects captured being mostly the same as found during a similar meeting in 1922. The following were Mr. Brown's captures, including one Homopteron new to Yorkshire.

LEPIDOPTERA.

Plusia festucae.

COLEOPTERA.

Hedobia imperialis L.

HEMIPTERA-HETEROPTERA.

<i>Nabis rugosus</i> L.	<i>Plesiocoris rugicollis</i> Fall.
<i>Leptopterna dolabrata</i> L.	<i>Corixa Sahlbergi</i> Fieb.
(immature).	

HEMIPTERA-HOMOPTERA.

<i>Aphrophora alni</i> Fall.	<i>E. auratus</i> L.	
<i>Cicadula fieberi</i> Edw.	<i>Delphax difficilis</i> Edw.	Long-winged form.
<i>Dikraneura flavipennis</i> Zett.		
<i>Eupteryx stachydearum</i> Hdy.	* <i>D. discreta</i> Edw.	

* New to Yorkshire.

Mr. A. Smith, of York, records the following :—

LEPIDOPTERA.

<i>Collix sparsata</i> .	12 specimens.	<i>Melanippe montanata</i> .
<i>Nonagria typhæ</i> .	Lavæ half-fed ; plentiful.	<i>Cabera pusaria</i> .
<i>Leucania pallens</i> .	Larvæ common.	<i>C. exanthemata</i> .
		<i>Lomaspilis marginata</i> .

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REVIEWS AND BOOK NOTICES.

Camping Out, by W. H. Miller. D. Appleton & Co., 325 pp., \$2.50. This is a book which should be useful and interesting to all types of campers. It gives a detailed account of all the various and most up-to-date camp equipment and types of tents, with chapters on Packing one's Outfit, Camping Out De Luxe, Horseback Camping, Camp Cooking, Tent Stoves, Automobile Camping and Winter Camping. Though of American origin, English campers will find much of service in its pages.

Tell-Me-Why Stories About Animals [Mammals], by C. H. Claudy. London: George G. Harrap & Co., Ltd., 303 pp., 3/6 net. The popularity of the Tell-Me-Why series is shown by the fact that a further reprint of this one has been called for. The book, of course, refers to American species, and an idea of the nature of the work can be assumed from the titles of the first two chapters, namely :—'The Story of Duggee, the Wolf, and Bones-Thrown-in-the-Firelight, and the Slit-Slant-Eyes-that-Became-Round, and The Story of the Builder with the Floppy Tail, of the Special Law for Water in the Time of Cold, and of the Winter Dinners that Stuck Big Ends between the Rocks.'

Through Field and Woodland, by Alice Rich Northrop. London: G. P. Putnam's Sons, 532 pp., 21/- net. Another well-illustrated book dealing with interesting aspects of American animal and plant life appears from the press of G. P. Putnam's Sons. It is a memorial to Alice Rich Northrop, the teacher and naturalist who did so much to popularise Natural History, and has been edited by Oliver P. Medsger. The whole volume is a series of popular essays dealing with innumerable aspects of animal and plant life, the narrative being considerably improved in value by the wealth of illustration, including numerous coloured plates, those of butterflies, beetles, etc., being of unusual value and attraction.

An Account of the City and County of the City of York from the Reformation to the Year 1925, by George Benson. 1925, 175 pp., price 15/-. It is an extraordinary fact that, no matter how many inhabitants there may be in any particular city or town, the number really reliable in connexion with the history of any particular place is usually remarkably small; in fact, as a rule, that number is *one*, and for York that one for years has been recognised as Mr. George Benson, architect and human being. Twenty-four years ago he produced the first part of his 'Chronicles of York,' six years ago the second part, as was noticed in these pages at the time. He now completes his historic record by describing York from the Reformation to 1925. With a pencil as ready as his pen, and a discerning eye, Mr. Benson is able to present a fascinating narrative, and every Yorkshire 'tyke' must be indebted to him for his present contribution. There are sixty-six illustrations.

Plant Life on East Anglian Heaths, by E. P. Farrow, M.A., D.Sc. Cambridge Press, x.+108 pp., 1925, 7s. 6d. net. To readers of *The Journal of Ecology* the work of Dr. Farrow on the Breckland Heaths will be familiar. Results of his very careful observations and ingenious yet simple experiments have appeared in a series of contributions to that *Journal* from 1915-1924. The present volume is essentially

a reprint of these papers. As a piece of field investigation this is a striking example of good and careful work, and one which will repay detailed study by all engaged in the study of vegetation problems and interested in the effect of animals on plant growth and development. The work is well illustrated by 46 photographs and 10 text figures. Dr. Farrow suggests that primitively the area was covered with forest, probably pine, oak, and birch, and its history is similar to that of the North German Moorlands, described by Graebner, viz. : that the present heath has arisen as the result of the degeneration of Woodland. Evidence is given that Breckland was especially favourable as a habitat for pre-historic man, due to the relative thinness of the forest ; the adjacent forests being denser and affording shelter for predatory animals.



Rabbit-grazed *Calluna* Hummocks.

The bare ground between is due to sand-blast.

Remains of early man are abundant as well as those of the Iron Age and Roman and post-Roman periods. For a long time the region has been treeless, but planting began in the middle of the 18th century, and there are now plantations of *Pinus sylvestris*, *Quercus sessiliflora*, and *Betula alba*. At present seedlings of these may survive, notwithstanding the fact that Breckland is climatically and edaphically the driest in England, but only in areas protected from the attacks of animals. He shows that degeneration followed human occupation, and the felling of trees, aided by grazing from domesticated animals, especially flocks of sheep pasturing on the heath ; the latter being chiefly responsible for the prevention of rejuvenation. From early Neolithic until modern times the woodland got no chance to regenerate. Later, when the rabbit had been introduced into England, and the heaths converted into a rabbit warren, destruction and modification reached their maximum. It is to the latter phase that most of this work is devoted, and readers will find in it a truly fascinating story.

We are pleased to notice that the popular book, **Tommy Smith Again at the Zoo**, by our contributor, **Edmund Selous** (London: Methuen & Co., Ltd., 180 pp., 2/9 net) has reached a third edition. Evidently, as the author suggests, books of this kind seem to sell better when written for children than if written for adults.

In Praise of Birds: Pictures of Bird Life, by **Canon C. E. Rover, D.D.** London: Martin Hopkinson & Co., 148 pp., 14/- net. By the aid of thick paper and several admirable plates, the volume written by the Chaplain to the King seems quite substantial. The author began life by wishing to be Julius Cæsar! he then wished to own stuffed birds; and finally desired to write a bird book. He was never Julius Cæsar; he may or may not have owned a 'stuffed' bird; but he has written a book on birds. He refers to An Amateur Bird Photographer, Three Years in Surrey, in the Dutch Dunes, The Waal en burg in Texel, At Koog and the Mug, A day with the Short-eared Owl, etc. As an appendix he gives hints to the photographer. There are several good photographs.

Notes on the Birds of Cley, Norfolk, by **H. N. Pashley**. London: H. F. & G. Witherby, 138 pp., 7/6 net. The area covered by the title of this work is very similar in many respects to Spurn Point, and the rare species of birds recorded there by the late H. N. Pashley recall very vividly the records which have appeared from time to time in *The Naturalist* from the pens of the late John Cordeaux, H. B. Hewetson, Philip Loten, T. H. Nelson and other former enthusiastic ornithologists. Perusal of the present volume, bearing in mind that Mr. Pashley was an excellent taxidermist, is more than usually reminiscent of the period referred to. Dr. B. B. Riviere gives a 'foreword,' and after some of Mr. Pashley's 'recollections,' we have his notes on the Bird Life, Extracts from his Diary, and his List of Cley Birds, all of which are interesting as records covering the period between 1887-1924.

Lundy: its History and Natural History, by **Lewis R. W. Loyd**. London: Longmans, Green & Co., 248 pp., 12/6 net. From its geographical position Lundy Island has always been of particular interest to the naturalist. In the present volume, following a chapter on discoveries and legends of prehistoric interest, the history is traced in some detail from the presentation of the island to Sir Jordan de Marisco by King Henry II. in the middle of the twelfth century, its subsequent grant to the Knights Templar, and their unsuccessful efforts to obtain possession of it, through its many vicissitudes as the headquarters of pirates and others, to the present day. To the history proper is added a full list of the birds which have been recorded as occurring on the island, together with copious notes, made from the observations of the compiler and others, on the dates of their appearance and their comparative status from time to time. The Geological, Entomological, Botanical and Conchological aspects of the island are also briefly dealt with.

Phases of Modern Science. A. & F. Denny, Ltd., 232 pp., 3/6 net. The British Empire Exhibition Committee of the Royal Society has sent us 'Phases of Modern Science,' to which a number of distinguished authors have contributed, which has been published in connection with the Science Exhibition arranged by the Royal Society in the Pavilion of H.M. Government at the British Empire Exhibition. The book has quite considerable interest and value to a scientific and general reading public, and arrangements have been made for its sale outside the Exhibition. Among the many chapters the following will particularly appeal to our readers: 'Darwinism,' by Mr. C. Tate Regan; 'Insect Mimicry and the Darwinian Theory of Natural Selection,' by Prof. E. B. Poulton; 'Life in the Sea,' by Dr. E. J. Allen; 'The Origin of Man,' by Sir Arthur Smith Woodward; 'The Human Brain,' by Prof. G. Elliot Smith; 'The Circulation of the Blood,' by Prof. E. H. Starling; and 'The Origin of Seed Plants,' by Dr. D. H. Scott.

NEWS FROM THE MAGAZINES.

Dr. Marie V. Lebour writes on Shore Fishes in *Discovery* for August. F. J. Killington gives 'Notes on the Prey of Dragonflies' in *The Entomologist* for August.

J. Delacour and M. Legendre describe 'The Woodpeckers' in *The Avicultural Magazine* for August.

F. H. Lancum has a paper on 'The Cuckoo' in *The Journal of the Ministry of Agriculture* for August.

Captain Cook's Artists,' by Tom Iredale, appears in *The Australian Museum Gazette* for July-September.

Parts 110 and 111 of *The Yorkshire Archæological Journal* are largely occupied by Mr. A. M. Woodward's scholarly and well-illustrated account of the Roman Fort at Ilkley.

Mr. Hans Schlesch favours us with a copy of his paper 'Beiträge zur Fauna der Land- und Süßwasser-Mollusken Süd-Zeelands,' 'Sonderabdruck aus Archiv für Molluskenkunde.'

Notes sur la flore crétacique du Groenland, Etude Critique, by Prof. A. C. Seward, are reprinted 'du Livre Jubilaire publié à l'occasion du Cinquantenaire de la fondation de la Société Géologique de Belgique.'

H. Donisthorpe describes *Dryophthorus corticalis* Pk., a genus and species of Coleoptera new to Britain, in the *Entomologist's Monthly Magazine* for August. The species was obtained in Windsor Forest.

Mr. C. E. P. Brooks describes the 'Fluctuations of Lake Victoria,' and G. D. H. Carpenter writes on 'The Geographical Distribution of Animals' in *The Journal of the East Africa and Uganda Natural History Society* for June.

'Sea-life Ashore,' by G. W. Weller; 'British Newts,' by W. K. Ford; 'The Great Water-bug,' by H. P. Jones, and 'Freshwater Molluscs,' by R. Garnett, are among the contents of the Summer Number of *The Amateur Aquarist*.

R. H. Brown contributes 'Field Notes from Cumberland,' and H. F. Witherby describes 'The Nestlings of some rare British Birds' in *British Birds* for August. In the same journal T. N. Roberts gives a photograph of a nest of a moor hen—made in a single night—and containing one egg, in one of the boats on the mere at Scarborough.

Mr. F. R. Rowley's Presidential Address to the Museums Association, delivered at the Exeter Conference, appears in *The Museums Journal* for August. He urges the appointment of a Royal Commission to deal with the status of Provincial Museums, appeals for more help in the way of specimens from the national museums, and deprecates the wholesale destruction of wild life for commercial or alleged scientific purposes.

Among the contents of *The New Phytologist* for August we notice 'The Enzymes of *Stereum purpureum*,' by J. K. Mayo; 'Virescence in Delphinium,' by R. R. Gates and W. R. I. Cook; 'The Inferior Ovary,' by Edith R. Saunders; 'The Effect of Light of Different Wave-Lengths on the Rate of Reproduction of *Volvox aureus* and *Glosterium acerosum*,' by A. Brooker Klugh; and 'The Importance of Abstracting Old Botanical Works and Manuscripts,' by J. C. Th. Uphof.

Mr. Henry Ogle edits the first part of *The Journal of the Ipswich and District Natural History Society* (68 pp.). Mr. J. R. Moir, as seems natural, commences with a paper on 'The Antiquity of Man in Ipswich,' which is commendable for its brevity. After describing what the author considers to be the deposits of the first, second and third Glacial Epochs of East Anglia, we are informed that 'The Upper Chalky Boulder Clay was then laid down.' Prof. P. G. H. Boswell has a paper on the 'Evolution of the East Anglian River Stour'; Major E. R. Cooper writes on 'The Suffolk Coast,' and Messrs. A. Bell, S. A. Notcutt and J. R. Moir describe 'Some Suffolk and Essex Crag Pits.' If Mr. Ogle is able to use his blue pencil without fear, this new journal should become a valuable publication.

NORTHERN NEWS.

Mr. J. Bailey has been elected President of the Museums Association for 1925-6, and the Conference next year will be at Bournemouth.

Durham Castle is in danger, and £30,000 are required to make it safe. Full particulars occur in *The Durham University Journal* for June.

Mr. H. H. Swinnerton describes a new Catopterygion Fish [*Woodthorpea wilsoni*] from the Keuper of Nottingham (*Q.J.G.S.*, March., pp. 87-99).

We learn from the press that a Flamingo has recently been captured on the Humberstone foreshore by Mr. Harold Brown, of Cleethorpes. It was doubtless an escape.

We have received the Annual Reports of the Norwich, Taunton Castle and Rochdale Museums, each of which has a record of the year's additions and activities.

At a geological excursion recently, which was specially arranged in order to benefit beginners and elementary students, the leader was concerned to find that his only 'beginner' present was a retired Professor of Geology.

The sixteenth edition of 'An Introduction to the Study of Minerals,' issued by the Mineralogical Department of the British Museum (Natural History) has been called for. It contains 72 pages, numerous diagrams, and is sold at one shilling.

'We ask again, as we have asked in the past, for more subscribers. Pioneer work [!] of any kind is difficult, and expensive,' is the monthly wail in a contemporary, which still assures us that last month it 'was sold out within a week of publication.'

Part 322 of *The Quarterly Journal of the Geological Society* contains Dr. J. W. Evans' presidential address on 'Regions of Tension,' and a paper by Prof. J. E. Marr on 'The Conditions of Deposition of the Stockdale Shales of the Lake District.'

The Report of the Committee of the Public Art Gallery and Museum of Belfast for the two years ending 31st March, 1925, contains, as frontispiece, a reproduction of a photograph of H.R.H. The Duke of York laying the Foundation Stone of the new Municipal Museum, Botanic Gardens Park, Belfast.

We have received the Fourth Annual Report of the Secretary for Mines and the Annual Report of H.M. Chief Inspector of Mines (H.M. Stationery Office, 197 pp., 6/- net). It contains a wonderful record of the output of the various coal, iron, tin, lead, zinc and other mines, statistics relating to output, accidents, etc.

Mr. Walter Bagshaw, the honorary curator, favours us with a copy of the Second Edition of the General Guide to Wilton Park Museum, Batley. There is a general and readable account of the exhibits, and illustration of an 'Old Interior' (a fireplace); and a special chapter on a 'Case illustrative of nesting colonies of sea-birds on the Yorkshire Cliffs'—the gift of the author.

The Geological Society of London has issued its 'Geological Literature [List of Authors and Titles] added to the Geological Society's Library during the year ended December 31st, 1924,' which may be gratifying to each author who looks to see if all his year's writings are included, but in the absence of a subject index the List seems to be a waste of good time and money.

We regret to notice the death of Mr. Thomas Dennis, of Hull, at the age of 87. He was one of the members of the old Hull Field Naturalists' Society, then of the Hull Scientific Club, and later of the amalgamated Hull Scientific and Field Naturalists' Club. He was a keen and able botanist, and formerly was a frequent visitor on the Excursions of the local Societies, his polite and gentlemanly bearing endearing him to many friends. He had the remarkable record of having served for seventy years with one firm of Hull solicitors. He was a regular and appreciative reader of our journal, *The Naturalist*.

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The Manchester Guardian says :—"This is a readable, popular history from the New Stone Age to the fifteenth century, with chapters on the feudal system, on the numerous monasteries in the district, and on the daily life of monk and layman in the Middle Ages. In the period to which it relates the Riding was the scene of many foreign invasions and of much civil war, and the author's object has been to show the relation of the local history to that of the nation. The volume contains many illustrations, and the price is astonishingly low for so handsome a work."

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Sept., 1925.

THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL
PRINCIPALLY FOR THE NORTH OF ENGLAND.

EDITED BY
T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums Hull;

and T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Technical College, Huddersfield.

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

G. T. PORRITT, F.L.S., F.E.S.

JOHN W. TAYLOR, M.Sc.

RILEY FORTUNE, F.Z.S.

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YORKSHIRE NATURALISTS' UNION.

BOTANICAL SECTION.

ANNUAL MEETING, Leeds University Botanical Laboratories, 17 De Grey Road, October 3rd, 3-30 p.m., for the adoption of the Annual Report and suggestions for officers and committees for 1926.

At 6 p.m. Prof. Priestley will demonstrate a micro-projection apparatus and speak on coal gas and peat plants. Dr. Pearsall will exhibit and speak on the forms of leaves.

Other exhibits and notes will be welcome.

CHRIS. A. CHEETHAM.

GEOLOGICAL SECTION.

President : W. S. BISAT, F.G.S.

The Annual Meeting of the Section will be held in the rooms of the Sorby Scientific Society, Church House, Sheffield, on Saturday, October 10th, 1925.

Business : Annual Report and election of Sectional Officers and Committees.

3-0 p.m. Exhibition of Local Fossils and Minerals, Micro-specimens.

Other exhibits will be welcome.

4-30 „ Lecturette :

5-0 „ Tea.

6-0 „ Business Meeting, followed by a Lantern Lecture on 'British Carboniferous Goniatites' by the President.

7-30 „ Lecturette :

8-0 „ Conversation and Refreshments, kindly provided by the Sorby Scientific Society.

JOHN HOLMES, *Hon. Secretary*,
Crosshills, nr. Keighley.

ENTOMOLOGICAL SECTION.

THE ANNUAL MEETING of this Section will be held on Saturday afternoon, October 17th, 1925, in the Library of the Leeds Philosophical Society, Park Row, Leeds, at 3 p.m.

T. B. KITCHEN, } *Hon. Secs.*
W. D. HINCKS, }

VERTEBRATE SECTION.

President of the Section : F. H. EDMONDSON, Keighley.

Meetings will be held in the Library of the Leeds Philosophical Society, Park Row, Leeds, at 3-15 p.m. and 6-30 p.m., on **Saturday, October 24th, 1925.**

BUSINESS AT THE AFTERNOON MEETING.—To consider and pass (a) Sectional Reports for 1925 and to elect Officers for 1926 ; (b) The General and Financial Reports of the Yorkshire Wild Birds and Eggs Protection Acts Committee for 1925, and to elect this Committee for 1926 ; (c) The Report of the Yorkshire Mammals, Amphibians, Reptiles and Fishes Committee for 1925, and to elect this Committee for 1926. The following papers will be given :—

'Migration,' by F. H. Edmondson.

'The Dotterel on the Grampians,' by T. H. Fowler (illustrated).

'The Greenshank on Scottish Moors,' by R. Chislett, M.B.O.U., F.R.P.S., and T. H. Fowler (illustrated).

Members or Associates are invited to attend and bring notes, specimens and lantern slides. Will Officials of Affiliated Societies kindly notify their members ?

E. WILFRED TAYLOR, *Hon. Sec.*,
10 Telford Terrace, York.

WANTED.—Advertiser requires a copy of Canon Fowler's work on *The Coleoptera of the British Islands* (5 or 6 volumes, 1887-91, or 1887-1913). Please send all particulars to A. A. Dallman, 17 Mount Road, Higher Tranmere, Birkenhead.

NOTES AND COMMENTS.

THE OTTER.

Professor J. Arthur Thomson writes on 'The Otter' in *The Journal of the Ministry of Agriculture* for September. He states 'The otter (*Lutra vulgaris* or *Lutra lutra*) belongs to the same family (*Mustelidæ*) as the badgers and stoats, and is ranked in the bear-like section of the order of Carnivores. That is to say, its affinities are rather with bears than with cats or with dogs. It is one of the oldest mammals in Britain (its bones have been found in the Norwich Crag of the Later Pliocene period), and it has established itself in all parts of the country. It is commoner than is supposed, but it readily escapes observation owing to its elusive ways and to the fact that it works a good deal under cover of darkness. It frequents streams where there is good fishing, and lakes as well; in some parts of the country it hides in caves by the sea shore and swims out to adjacent islands. It must be regarded as a very successful animal for, in spite of much persecution, it enjoys a wide distribution both in the Old World and the New, especially in the more northern parts. The "holt" or "hover" is in most cases a well hidden hole by the side of the stream, and the exit is usually under water so that the tenant can slip quietly away. Although the otter is so much at home in the water, it likes to rest and sleep in a dry place, and the "nest" is often made comfortable with reeds and grasses bitten into short pieces. In some cases the same otter seems to have several "holts."'

BRITISH HYDRACARINA.*

We all know what a wonderful part the mite plays in the economy of the earth. The widow's mite and what it meant is an early example. But as time has gone on, other mites have existed and others have ceased to be. But the mite—like the mite-y atom—takes its place in the world's history. The Ray Society certainly has done much to foster the study of the usually neglected orders. Before us is Volume I. of *The British Hydracarina*, by C. D. Soar and W. Williamson. the former being well known to our readers from his contributions to our journal, in association with the late Dr. C. F. George, of Kirton Lindsey, to whom we were indebted for so many valuable contributions on the Mites of the north of England. Quite apart from the useful bibliographical and descriptive details relating to the species enumerated in this section of the work, the present contribution is outstanding on account of the excellence and beauty of the

* By C. D. Soar and W. Williamson. Vol. I., pp. 1-216, Pl. I.-XX. Ray Society, c/o British Museum (Natural History), Cromwell Road, S.W.7. Price 37/6.

coloured plates, twenty of which accompany the volume. These are from drawings by Mr. Soar, who must be congratulated on the way in which he has carried out a very difficult work.

THE BRITISH ASSOCIATION.

The British Association meeting at Southampton was hardly up to the usual standard in many ways, and the attendance resulted in very severe cuts having to be made in the way of grants for scientific research. The various meeting rooms were at inconvenient distances from each other, and the hostel where the chief officials of the Association and others were entertained was more than two miles from the reception room and railway station, causing an expenditure in the way of taxis which would have gone well towards paying an hotel bill. Even ordinary bedroom requirements were lacking; and the one announcement which appealed to some of the guests that 'intoxicating liquors could be arranged for on application' was found to be fiction. The arrangements with regard to excursions were left in the hands of a local firm, which seemed incapable of organising them. The popular trip to Stonehenge, Salisbury and Winchester was timed to start at 8-30 a.m., necessitating those staying at the hostel having to arrange for breakfast an hour earlier than usual. After the expense of a taxi in order to be at the starting point in time, the party waited, with over 200 others, until nearly 9-30 before a single char-a-banc appeared. Other vehicles arrived at intervals, and when the present writer was able to get a seat, about 10 a.m., word was brought that vehicles for the remainder of the party had been telephoned for from Bournemouth! Some never started at all; others were only able to cover part of the journey, and, we believe, recovered part of their fare. Without in any way suggesting that the local officers did not do all that was possible, we certainly think that at least one of the local secretaries should have attended several previous meetings so as to become familiar with what the members want, and, what is of more importance, with what the members do not want.

THE ADDRESSES.

Prof. Horace Lamb's Presidential Address was admirable, dignified, and was precisely what such an address should be; but whether on account of the poor acoustic properties of the hall or for some other reason, few of the audience, we fear, were able to follow the address. Dr. Simpson's address to Section A dealt with the New Ideas in Meteorology; Dr. Cecil H. Desch (Section B) referred to the Chemistry of Solids; Prof. Sparks spoke to Section C on Cultural Aspects in Geology; Mr. C. Tate Regan discoursed on Organic

Evolution to Section D ; Mr. A. R. Hinks referred to the Science and Art of Map-making in Section E ; Miss Lynda Grier addressed Section F on the Meaning of Wages ; Sir Archibald Denny gave an account of Fifty Years' Evolution in Naval Architecture and Marine Engineering to Section G ; Practical Engineering in Ancient Rome was the title of Dr. T. Ashby's address to Section H ; Prof. A. V. Hill gave the Physiological Basis of Athletic Records to Section I ; Prof. G. Spearman described Some Issues in the Theory of ' G ' (including the Law of Diminishing Return) to Section J ; Prof. J. Lloyd Williams dealt with the Phæophyceæ and their Problems for Section K ; Mr. W. W. Vaughan's address to Section L was entitled the Warp and Woof in Education ; and Dr. J. B. Orr took the Mineral Elements in Animal Nutrition as the subject of his address to Section M. Sir Daniel Hall's Presidential Address to the Conference of Delegates of Corresponding Societies was entitled Corresponding Societies and the Schools. Mr. R. V. Southwell gave an evening discourse on Some Aeronautical Problems. Four Citizen Lectures were given, viz., Science and the East African Commission, by Major A. G. Church ; the Rôle of the Atmosphere in Wireless Telegraphy ; Capt. P. P. Eckersley on Some Technical Problems of Broadcasting ; and Mr. C. J. P. Cave on the Highway of the Air. Three lectures were arranged for young people : Dr. F. A. Dixey dealing with Mimicry in Relation to Geographical Distribution ; Prof. W. J. Dakin on Whaling in the Southern Ocean ; and Mr. W. H. Barker on the Development of Southampton in relation to World Commerce.

THE JOURNAL.

According to the admirable *Journal of Scientific Transactions* (which gave the times at which the various papers were read at the different sections, and summaries of many of them), Section A (Mathematics) had 21 papers delivered ; B (Chemistry), 11 ; C (Geology), 17 ; D (Zoology), 21 ; E (Geography), 18 ; F (Economic Science and Statistics), 11 ; G (Engineering), 16 ; and there were 6 joint discussions with sections F and G ; H (Anthropology), 32 ; I (Physiology), 13 ; J (Psychology), 18 ; K (Botany), 32 ; (and sub-section, Forestry, 18) ; L (Education), 12 ; M (Agriculture), 14 ; and at the Conference of Delegates, 5. It will thus be seen that the fare was ample for all ! In addition, several of the sections had special exhibits and held afternoon excursions, the archæological, botanical and geological features of the area being of great interest. It is not possible to give summaries of all the papers likely to be of interest to readers of *The Naturalist*, but the following are among the many.

PROF. E. W. MACBRIDE ON THE MIGRATORY HABITS OF ECHINOCARDIUM.

The genus *Echinocardium* is taken by Petersen as characteristic of one type of the series of animal communities which he has described as occupying definite territories all over the bottom of the North Sea. The two species, *E. cordatum* and *E. flavescens*, are abundant throughout this area, and each is characteristic of a certain type of community. Under these circumstances the habits of each species become of importance and interest. *E. cordatum* is found within tide marks on sandy beaches all along our western coast, and is particularly abundant just above the limit of low spring tides in Harlech Bay, which I visit every summer. It is found occupying a burrow about three inches below the surface of the sand, communicating with the surface by a vertical shaft, up which it extends its long tube feet in order to gather food. Yet no specimens less than four inches in length could be found. From previous work it is known that the young urchin, just after metamorphosis, is only $\frac{2}{3}$ mm. in length, yet the most diligent sifting of the sand through fine sieves failed to reveal intermediate stages. Mr. Elmhirst, Curator of Millport Biological Station, sifted the sands of Kaines Bay, Millport, where the adult is abundant, with a like negative result. On the other hand, Dr. Mortensen sent me an abundant supply of the stages I sought, dredged from deep water. It is clear, therefore, that the abundant adult forms must have migrated into their present positions—in a word, that the animal does not remain constantly in its burrows, but at high tide comes up to the top and walks about.

MR. M. A. C. HINTON ON THE PLEISTOCENE MAMMALIA OF THE BRITISH ISLES AND THEIR BEARING UPON THE DATE OF THE GLACIAL PERIOD.

Moderate opinion holds that there were two distinct glaciations of Britain, an earlier or 'major glaciation' between the deposition of the Cromerian beds and the formation of the High Terrace of the Thames, and a later or 'minor glaciation' towards the end of the Pleistocene period. An argument is now presented to show that the 'major glaciation' of Britain was an episode of late Pleistocene time. The Cromerian beds and the terrace deposits of the Thames form parts of one great series, and afford no valid physical evidence of an early Pleistocene 'major glaciation.' The fossil mammalia are definitely opposed to any theory which involves a break in the continuity of the terrestrial life of this country between Cromerian and late Pleistocene times. An older mammalian fauna of southern character, possibly of African origin, lingered from Cromerian to early Middle Terrace times ;

and some of its species show definite evolutionary changes when traced from older to newer horizons. In later Middle Terrace times this older fauna was completely replaced by mammals of northern character or Asiatic origin, and these newcomers held the country until the close of the Pleistocene period when the most characteristic species became either totally or locally extinct. The arguments as to a former cold climate commonly based upon the occurrence of such animals as the Varying Hare, the Snow Vole, and the Arctic Lemming is misconceived and unsound.

MR. IAN A. RICHMOND ON ROMAN CAMPS AT CAWTHORN, NEAR PICKERING, N. RIDING, YORKS.

Two periods of occupation are so far certain. (1) In the first was built a six-acre camp, A, with a narrow gateway on each side, but within the N.E. and S.E. angles were mounds for artillery. Conditions in the ditches prove that this occupation was short. (2) The second occupation added a $5\frac{1}{2}$ -acre camp, B, to A's eastern side, which was protected by low turf ramparts and by a ditch (E side). The five gateways, three of A and two (N. and S.) of B, were provided with internal and external lunate mounds of defence (Hyginus's *claviculæ*), but no gates, and the ditch was either interrupted (B) or filled up (A) in front of them. On the E. side, and at the N.E., were turf-built mounds for artillery. Internally there are slight road-ways and buildings (including barracks and a *tribunal*), made of turf, aligned to the roads, and apparently containing pits and fire-places. Between the rampart and the road behind it were stone-built ovens, provided with stoke-holes, and, in one case at least, with a shelter supported by slud posts. Three other ovens were found in like position, but excavated in, and built of, imported clay. Contemporary with B was camp C, a six-acre, coffin-shaped camp, with three east gates only, defended by external *claviculæ*, and having turf buildings. Overlying the S.W. end of C was a three-acre fort, D, apparently never finished, but closely resembling the Roman camp in Hod Hill fort. Finds have been very few and valueless for dating within the Roman period. The type of fortification makes it legitimate to assign the earthworks to the period of Roman conquest in Yorkshire, perhaps to Cerialis or Agricola, or both. It is clear that we are about to learn something of a new kind of Roman fortification, bridging the gap between the tent-covered marching-camps of Scotland and the siege-camps, crowded with temporary buildings, as at Masada (Arabia) and Castillejo, Peña Redonda, or Renieblas (Numantia, Spain).

PROF. F. O. BOWER ON ADAPTIVE CHARACTERS.

At the opening of the discussion it will be well to see clearly

what is meant by the words used in its title. The expression 'adaptive' is often applied loosely for any character to which a reasonably probable use can be ascribed. Causality in relation to that use is then liable to be assumed, without any evidence being adduced to show that the character actually originated in relation to the conditions which it may effectively meet. To speak thus of a character as adaptive is merely to apply to it a question-begging epithet. Few of those who lightly use the word have ever adduced evidence that the character really is adaptive in the evolutionary sense in any specific case: that is, that the development, individual or racial, originated in accommodation to circumstances. On the other hand, if the character were actually adaptive in this sense, it might be expected that, in the absence of the causal condition, the character should be modified, or even disappear. But it cannot always be presumed that a feature held as adaptive must necessarily disappear: provided that it be not harmful it may persist, even though its primary cause is absent, for it may have passed into the category of inherited characters. Thus we may hold it as possible that fluctuating characters, arising first as consequences of immediate accommodation, may become permanently fixed. The discussion will naturally lead to the question of the inheritance of characters thus acquired. In the comparative study of ferns, checked by reference to the related fossils, it is believed that evidence has been obtained of the secular inheritance of characters in the first instance acquired and adaptive; and that in the course of evolution, extending from the palæozoic period to the present day, those characters have become permanently fixed. The best instance is in the adoption of a protective superficial position of the sorus, though comparative evidence of ferns, fossil and living, indicates that the distal or marginal position was the original one. Other examples are seen in the adjustment of the vascular tissues in relation to increasing size and in the absence of secondary thickening, so as to maintain a suitable proportion of surface to bulk. Such adjustments have frequently become hereditary.

PROF. J. PRIESTLEY ON ADAPTIVE CHARACTERS.

The fact that the existence of adaptive characters receives a partial explanation upon the hypothesis of natural selection, has led to a much too facile interpretation of structural features of the plant as adaptive. Such an interpretation should always rest upon definite experimental evidence that the structural features concerned perform the functions assigned to them. The result of such experimental examination has recently been illustrated in the study of various epidermal

structures which are interpreted on theoretical grounds as devices for controlling transpirations. Interpretation as an adaptive character still leaves the structural feature in question open to elucidation upon the lines of causal anatomy. This alternative method of approach is illustrated by a brief examination of the main features of stelar anatomy in the ferns.

DR. D. H. SCOTT ON ADAPTIVE CHARACTERS.

The modern reaction against adaptation appears to be due to several causes :—(1) The weakening of the Darwinian position, involving less reliance on Natural Selection. (2) Distaste for the too facile assumption of hypothetical functions on the part of some zealous Darwinians. (3) The influence of Mendelism, which has no use for adaptations. (4) The rise of the mechanical line of investigation, which is concerned only with the becoming of the mechanism, not with its working when in being. Probably the whole controversy is rather a matter of point of view than of any fundamental difference of opinion. That every organism is essentially a mechanism or systems of mechanisms is manifest. There cannot be a mechanism without adaptation, nor can there be physiology without the idea of function. Prof. Priestley is right in insisting on the mechanical side of the question. We want to know both how the mechanism is made and how it works ; whether we are dealing with a steam-engine or a living plant. The latter question—the working—is of more general interest, but the scientific value is equal. The physiological study of development is a new departure and has everything still to accomplish. But we also need to make a fresh start with the investigation of function, as is shown, for example, by the doubt recently cast on supposed xerophytic adaptations. Few will be content with the solution ‘there is no function,’ an assumption as facile and perhaps as futile as some of the hypothetical functions imagined by too confident Darwinians of a past period.

CORRESPONDING SOCIETIES AND SCHOOLS.

In his address to the Conference of Delegates of Corresponding Societies, Sir Daniel Hall stated : I should like to see on the walls of every village school a series of parish maps. There would, first of all, be the normal cadastral map, the Ordnance Survey on the 1-inch or 6-inch scale, on which antiquities and any connections with wider history are specially indicated. Alongside this map should be a geological map, the Drift Edition if available, with some manuscript indications of the variations of soil as far as they are correlated with the geological indications of the map. In certain areas the local Agricultural College would be able to supply

a good deal of information about the characteristics of the soils of the parish, but as yet there has been no systematic soil survey all over the kingdom. The next map should be a vegetation map, and, naturally, it will be closely connected with the geological or soil map. It should indicate the prevalence of woodland, marsh or pasture, the characteristic weeds of the arable land, the special features of the flora of the wild land, and the types of grasses characteristic of the pastures. Of course, there are parishes so uniform in their soil that this vegetation map may be of the simplest character, but there are many parishes possessing great and characteristic diversities of vegetation which children soon learn to recognise, especially as so many parishes were originally formed as strips cutting across the outcrops so as to provide a portion of each kind of soil for the needs of the parish. Alongside this map should be one showing the actual cropping followed in the parish in any particular year, the fields being coloured on a system and the crops being ascertained by actual enquiry. Lastly—and here is the point on which I desire particularly to address myself to the members of the Corresponding Societies—one would like to see a map or maps that would bring out the original settlement of the land, the manors, and the system of cultivation adopted before enclosure, and the date and method of enclosure.

WHAT IS A HERBALIST?

According to Dr. J. Skelton, in *The Medical Herbalist* for September, a herbalist is 'a man whose faith is based upon science, a man who amidst the revolutions and changes of time prefers rather to endure the scoffs of the ignorant, and scorn of the foolish, than yield one inch of his right to think and act as a free man, a man whom contempt cannot injure nor power crush, a man who worships in the great temple of nature, who bows his head in humility and thanks his Maker for the herbs and flowers, a man who, standing upon the rock of eternal truth, feels himself secure, and knows that medicine can have no other foundation, reason no other guide, science no other law. Folly may smite, prejudice scorn, cupidity curse, tyranny perish, and medical despotism cry infamous, but truth continues, and the herbalist lives on, not a life of the present alone is his, but of the past and future, not the mean thing that folly has made him, but a companion for philosophers and kings.'

ANOTHER 'STONE-AGE' SKELETON.

We learn from the press that 'the skeleton of a neolithic (New Stone Age) man, probably 5000 years old, has been found at Grassington, Upper Wharfedale. The man was

buried in a crouching position. Unfortunately, no part of the skeleton was intact, except the thigh bones and the jaw bones. All the other bones were there, but they were badly broken and decayed. The teeth of both the lower and upper jaws, however, were well preserved. It was difficult to fix an exact date to these discoveries, but this man lived probably not less than 5000 years ago.

GRASSINGTON AND AMERICA.

A further report states that 'the conclusions of Mr. John Crowther, of Grassington, in reference to the skeleton found at Grassington, have been confirmed by Professor Gilligan, of Leeds University. The Neolithic man, says the professor, was the earliest known in Yorkshire. It was difficult to fix an exact date to these discoveries, but he thought that this man lived not less than 5000 years ago. These people were cave dwellers. In Yorkshire there was no evidence of true palæolithic types (an earlier race), but it was definitely known that neolithic man did live there. A university student set up the last skeleton, which was found at Grassington, and which was authoritatively pronounced to be neolithic. Neolithic man was probably small in stature, and appeared to be a distinct race from palæolithic, the latter race appearing to have been wiped out completely. It was at the neolithic phase of human development that peoples of the Mongolian breed first made their way into America.' Personally, we are satisfied that the press has misrepresented Professor Gilligan's remarks, as it seems difficult to understand what possible evidence there is of this or the previous skeleton being neolithic in date in the absence of associated relics, or, in fact, of any evidence whatever. A neolithic skeleton would be of such importance in Yorkshire that it is a pity we are not informed of the author of the 'authoritative pronouncement.'

PETERSEN'S YOUNG FISH TRAWL.*

From a report just received we gather that 'from a study of the numbers of cod larvæ and four other planktons captured in ten successive hauls of Petersen's Young Fish Trawl during daylight, with wind strength 0.2 on the Beaufort scale, the standard deviation (expressed as a percentage of the mean) varies from ± 27 to ± 54 per cent. That of the cod larvæ of 8 mm. length is ± 38 per cent. These figures are compared with other results obtained by Herdman using a "Nansen" net, and are seen to be of about the same order of magnitude. In the opinion of the writers, variations of this order are considered in no way to invalidate results obtained with this

* 'The Working Error of Petersen's Young Fish Trawl,' by A. C. Gardiner and Michael Graham. London: H.M. Stationery Office. Fishery Investigations, Ser. II., Vol. VIII., No. 3, 8 pp., 1/- net.

engine, but indeed probably represent a condition as nearly consistent as can be expected in view of the lack of uniformity of the horizontal distribution of the plankton.'

A GEOLOGICAL CHART.*

This chart measures 25 in. by 20 in., and is divided into two principal columns dealing respectively with the 'Fauna and Flora' and the 'Distribution of Rocks and History of Deposition'; the main features of each Era are dealt with in a smaller column, while the Systems are represented by a series of coloured spaces. The chart is described as being suitable for hanging in the class-room. Its aim is to give in clear and simple form the main outlines of geological history. To accomplish this aim is no light task, for the difficulties are obvious; one needs in a compilation like this the outlook of a palæontologist, a geologist, a teacher and an editor. A palæontologist would modify several of the statements of fact presented here; and he would at least shorten the list of birds in the Eocene, and say a little more about the Cambrian fauna. A geologist, while realising the difficulties of making accurate generalizations in a small space, would, for example, amplify the statement that Gondwanaland 'occupied the site of the existing Indian Ocean.' A teacher would probably suggest the use (for beginners) of more general terms than, say, *Atlantosaurus* and *Cheirotherium*. He would also think that 'the appearance of the forerunners of the elephant' is a more suitable phrase than 'the appearance of gigantic Proboscideans.' Moreover, he would not refer to Birds as being 'absent' from the Palæozoic when actually their first appearance was much later in the geological time-scale. And probably the teacher, if not the editor, would see that the relation of Systems to Periods was made quite clear. We should not read that 'the systems of the Cainozoic occupied a much shorter time . . .'. An editor, noting in the first column 'Group or Era,' would add 'or Periods' to 'Systems' in the second column. He would not like to see, either, terms of such varying denotation as, for example, 'Deinosaurs' and 'Atlantosaurus,' given equal typographic treatment in full capitals. The plan of this chart is well conceived, and the selection of examples is excellent. The widespread use of a chart such as this may be the means of attracting hundreds of young people to the science of geology. It would be impossible, therefore, to devote too much care to its production or improvement; and we have commented on a few points merely to show that any work intended for beginners should be freely criticized before being published.—C.

* By Lieut.-Col. F. T. Talbot, D.S.O., F.R.G.S. (T. Murby & Co., 1 Fleet Lane, London, E.C.4, price 1/4 net) [1925].

NOTES ON YORKSHIRE AMMONITES.

DR. L. F. SPATH.

VI.—ON *AMMONITES PLANICOSTA* J. SOWERBY.

THE well-known *Ammonites planicosta* J. Sowerby¹ was referred to in the last chapter as the commonest ammonite of the Asteroceratan age. This ammonite has figured in Yorkshire lists of fossils since the time of Young and Bird² for over a hundred years; but, unfortunately, what Dumortier³ wrote in 1867 still holds at the present day, namely, that there was 'no satisfactory figure of this ammonite, which was yet one of the most important and most characteristic species of the upper beds of the Lower Lias.' Dumortier was astonished at the frequent misidentification of this ammonite, even by d'Orbigny, but his own determination was scarcely less erroneous. For, although he quoted in his synonymy of *Ammonites planicosta*, the specimen depicted by Zieten,⁴ which belongs to a later, independent, but allied species, referred to below, Dumortier's figured example, probably a *Gagaticeras* of Oxynoticeratan age, has nothing to do with Sowerby's species, and was separated from *Ammonites planicosta* and renamed (*Amm. vesta*) by Reynès⁵ already in 1879. To clear up the tangle now seems a thankless task, but it is necessary to fix at least the type of *Ammonites planicosta*.

Young and Bird's, Simpson's,⁶ Blake's⁷ and Crick's⁸ determinations of Yorkshire examples of the group of *Ammonites planicosta* may be incorrect from the modern point of view, but far more serious errors of identification have been committed by other authors. The absence of good figures may be partly to blame for this, especially in the case of authors who had no topotype material for comparison. It may suffice to point out in this connexion that Hyatt,⁹ for example, was induced, by Sowerby's unsatisfactory figures, to unite, with the Marston form (of Pl. CDVI., non Pl. LXXIII.), in one species '*Deroceras confusum*,' the entirely unrelated *Hemimi-*

¹ *Mineral Conchology*, Vol. I., 1814, Pl. LXXIII.

² 'Geological Survey of the Yorkshire Coast,' 1822, p. 248; 2nd ed., 1828, p. 259.

³ *Loc. cit.*, Vol. II., 'Lias Infér.', 1867, p. 167.

⁴ Verstein. Württembergs, 1830, p. 6, Pl. IV., fig. 8. The type is not among the three examples of '*Amm. capricornus*' from Zieten's Collection in the British Museum (Nos. 62591 a-c), unless the figure is a composite one.

⁵ *Loc. cit.* (Atlas), Pl. XLV., figs. 47-49.

⁶ 'Fossils of the Yorkshire Lias,' 1884, p. 75.

⁷ In Tate and Blake; *loc. cit.* (1876), p. 275.

⁸ *The Naturalist*, 1922, p. 275.

⁹ 'On Reversions among the Ammonites,' 1870, p. 39.

croceras ? *lohbergense* (Emerson),¹ and the still later *Uptonia confusa* (Quenstedt). On the other hand, a far too comprehensive interpretation of the species caused Wright² to figure under this name, *not* the true *Ammonites planicosta*, but five different forms³; and of the eight figures cited in his synonymy, none belongs to Sowerby's species as here understood. It is curious to note that Wright also did not include in his *Ægoceras planicosta* the Marston form, figured by J. de C. Sowerby, and that owing to an equally wide interpretation of Sowerby's *Ammonites obtusus*⁴ this common Lyme form, second in importance only to *Amm. planicosta*, also escaped delineation in the famous Monograph of the Lias Ammonites.

Frebold's⁵ latest correlation, published this year, still suffers from the same defect; for his *Amm. planicosta* also is too widely interpreted, which prevented him from realising the enormity of the gap between the *birchi* and *ziphus* zones. But to review the whole history of *Amm. planicosta* would take us further than the writer cares to go or the reader is patient enough to follow. Being concerned, for the present, with Yorkshire ammonites, it seems preferable to examine which species actually occur in this county, and to show that *Amm. planicosta* in the restricted sense is not one of them. Confirmation by zonal collecting here again is desirable, for our conclusions are based mostly on museum material, and Simpson, in 1884 (p. xxii.) recorded '*Amm. planicostatus*' from two beds about thirty feet apart.

It must be borne in mind, when determining the type of *Ammonites planicosta*, that in slabs like that figured by J. Sowerby (Pl. LXXIII.) the associated forms are *Xiphoceras dudressieri* (D'Orbigny) and allies, *Asteroceras stellare* (J. Sowerby) and *Asteroceras margaritoides*, nom. nov.⁶ The larger examples of '*Ammonites planicosta*,' figured by Sowerby in the left-hand top and right-hand bottom corners of fig. 1—the first copied by Brown⁷—are evidently, by their size alone, immature forms of the *dudressieri* group, but the

¹ See *supra*, p. 140.

² *Loc. cit.*, pt. 3, 1880, Pl. XXI., pt. 4, 1881, p. 293.

³ See *supra*, pp. 268-269.

⁴ *Mineral Conchology*, Vol. II., 1817, p. 151, Pl. CLXVII., upper fig. only. The section (lower fig., B.M., No. 43970) belongs to *Asteroceras stellare* (J. Sowerby). Wright's example (B.M., No. C2223) of Pl. XXI., figs. 3-4, with 30 costæ, greater compression and more prominent keel than *Asteroceras obtusum* is now renamed *Ast. confusum*, nom. nov.

⁵ 'Über Cyklische Meeres-Sedimentation.' Leipzig, 1925, p. 8.

⁶ Large fragment in the middle of Sowerby's Pl. LXXIII. (as represented by B.M., No. C17945c) distinguished from the associated [small] examples of *Ast. stellare* by the absence of a stellate centre and by having compressed whorls already at 15 mm. diameter.

⁷ 'Illust. Fossil Conch. Great Britain,' 1849, Pl. VII., fig. 7.

example represented in fig. 5 is probably fully grown. Sowerby's statement about the circular mouth cannot be taken literally, for no species of the *planicosta* group has a round whorl-section as depicted in Sowerby's fig. 3, and Simpson already in 1855 (p. 45) altered the diagnosis to 'nearly circular.' Some small form resembling Sowerby's fig. 5, and superficially also *Ammonites capricornu*, was clearly taken as typical by d'Orbigny,¹ who created a new species, *Amm. dudressieri*, for the tuberculate types. Indifferent illustrations in various works on common British fossils and the large slab figured in one of the British Museum Guides,² represent the small form

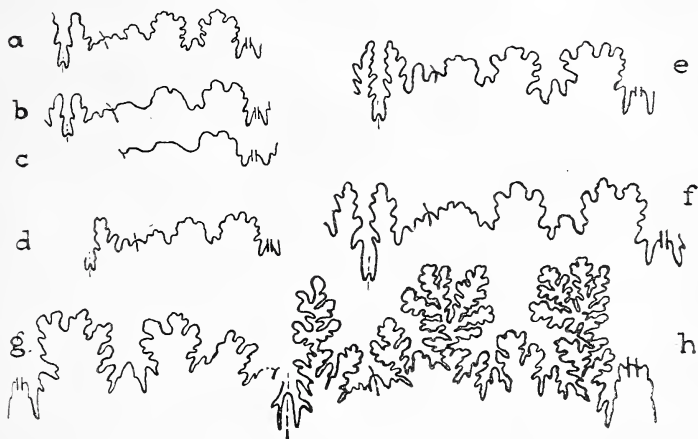


FIG. 8.

(a-c) Suture-lines of *Promicroceras marstonense*, sp. nov., from Marston Magna (B.M., No. C2353a-c); (a) at diameter of 15 mm., b at 8 mm., (c) at 5 mm. (beginning of costation).

(d) *Promicroceras aureum* (Young and Bird) from Robin Hood's Bay (B.M., No. 17670, Ripley Coll.), at diameter of 12 mm. (\times about 3).

(e) *Promicroceras pyritosum*, sp. nov., from Charmouth (Dr. Lang's Bed 81) at diameter of 17 mm. (end of septate portion), \times about 3.5.

(f) *Promicroceras planicosta* (J. Sowerby), from Charmouth (*planicosta* zone, bed 85), collected by Mr. L. R. Cox, at diameter of 17 mm. (end of septate portion), \times about 4.

(g) *Xipheroceras* ? cf. *dudressieri* (d'Orbigny) from Charmouth (L.F.S., No. 1859, bed unknown), at diameter of 22 mm. (= about 3.5). Inner whorls indistinguishable from *Promicroceras planicosta* (unusually delayed or hybrid?).

(h) *Xipheroceras* aff. *rasinodum* (Quenstedt) from Charmouth (Dr. Lang's bed 85=*planicosta* zone), collected by Mr. L. R. Cox, at diameter of 55 mm. (\times about 2).

¹ *Loc. cit.* (1845), p. 325, Pl. CIII.

² 'Fossil Invertebrate Animals,' 1907, p. 167, Pl. VII., upper fig. ('weathered surface') only.

figured by Sowerby, and this was also in the mind of nearly every recent British writer¹ who had occasion to refer to *Ammonites planicosta*. It seems advisable then to select fig. 5 of Sowerby's plate LXXIII. as type of *Amm. planicosta*, and since the original example cannot now be traced, to take as neotype an example in the Wright Collection (B.M., No. C.2235), associated in the same block with *Xipheroceras dudressieri*,² *Asteroceras margaritoides*, and *Ast. stellare*.

Before discussing the relations of this restricted *Amm. planicosta* to allied species, it is necessary to rectify the generic nomenclature. Mr. Buckman³ in 1911, created the genus *Xipheroceras* for '*Ægoceras planicosta* ; Wright, 1880, XXV. = *A. ziphus* Zieten.' This was referred to above (p. 269) as assignable to Quenstedt's *Amm. armatus rasinodus*⁴ and the suture-line of a specimen probably close to this *Xipheroceras rasinodum*, as interpreted by the writer, from the *planicosta* zone (bed 85 of Dr. Lang) of Charmouth, collected by Mr. L. R. Cox, is here figured (text fig. 8h). The genotype of *Xipheroceras* is thus closely allied to the forms previously described as *X. ziphiforme* and *X. perarmatum*, probably also to *X. simile* nom. nov.⁵, intermediate between *X. rasinodum* and *X. dudressieri* (d'Orbigny). This last species, as variable in tuberculation as *X. rasinodum*, has a simple suture-line (compare text fig. 8g and Dietz, *loc. cit.*, 1923, fig. 14b, p. 401), and unless it be regarded as a reduced form and therefore converging towards *Promicroceras*, its reference to *Xipheroceras* is doubtful. For, judging by Dr. Lang's Charmouth material, the species of the *rasinodum* group, also *X. æquicostatum*, may be connected with forms resembling *Xipheroceras*? **problematicum**, nom. nov. (= *Ammonites ziphus* Reynès, pars, non Hehl, *loc. cit.*, Pl. XL., figs. 5 and 6 only) and the equally doubtful *X.?* *pseudoziphus* referred to above (p. 269). This last resembles certain compressed equivalents of *X. æquicostatum*, and the depressed types may include Dumortier's *Amm. locardi*,⁶ which is more regularly costate than *X. simile* nov. But in view of the surprisingly varied Ectocentritidæ that existed at about this period in Mediterranean areas, it is yet doubtful whether these *Xipheroceras* with

¹ Except such apparent misidentifications as Mr. B. Thompson's in 'Northamptonshire,' *Geology in the Field*, Part 3, 1910, p. 455.

² Figured in Wright, *loc. cit.*, 1880, Pl. XXIV., fig. 5 only, B.M., No. C.2235. The other ammonites contained in the same block of rock were omitted in Wright's figure.

³ *Yorkshire Type Ammonites*, Vol. I., p. iv.

⁴ *Loc. cit.* (1884), Pl. XXIV., fig. 26. The differences between Quenstedt's and Wright's figures are apparently not of specific importance.

⁵ *Ammonites armatus*, Quenstedt, pars, non Sowerby, *loc. cit.* (1884), p. 198, Pl. XXIV., fig. 29 only.

⁶ *Loc. cit.* (II., 1867), p. 129, Pl. XXVI., figs. 1-3.

complex suture-lines are directly connected with the stock that produced forms like *Microderoceras scoresbyi* (Simpson) S. Buckman sp.,¹ of which two complete suture-lines are here figured (figs. 9 g, h) and two new species of *Microderoceras*, one of which is before me from Yorkshire (B.M., No. 89018) as well as from Lyme (L.F.S., No. 1856). The bed of this last example is unknown, but the specimen probably came from just above the *birchi* 'Tabular Limestone,' to judge by fragments in Dr. Lang's Collection. The second new *Microderoceras*, above mentioned, a dwarf offshoot, considerably more evolute than, but resembling *X. ? problematicum*, with distinctly capricornic inner whorls, still occurs high up in the *capricornoides* zone. It may be noted in passing that here, as in many other cases, the squeezing-out of stages by

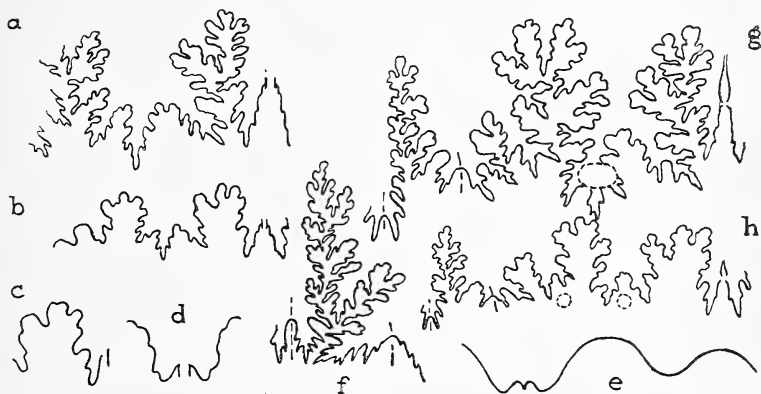


FIG. 9.

(a-f) *Microderoceras birchi* (J. Sowerby), Lyme Regis : (a) at diameter of 25 mm. ; (b) at 10 mm. (appearance of first tubercle) ; (c) at 8 mm. (rursiradiate lineation only) ; (d) at 3.5 mm. ; (e) at 3 mm. (showing low median saddle in E) ; (f) Internal lobe at 85 mm. (\times about 1.5) from another example (L.F.S., No. 1858) ; (g, h), *M. scoresbyi* (Simpson) S. Buckman sp. from Drift (ex Lower Lias) of Withernsea, Holderness (example recorded by Mr. C. Thompson, *Quart. Journ. Geol. Soc.*, Vol. LXIX, 1913, p. 180) in Hull Museum ; (g) at diameter of 60 mm. (\times about 2) ; h at 20 mm. (\times about 2).

tachygenesis does not seem to hold. The capricorn stage of the later *Microderoceras* can only be cœnogenetic, i.e., the new character first appears on the inner instead of the outer whorls. Moreover there is neither a secondarily unituberculate nor a costate stage in *Microderoceras* that could be

¹ *Yorkshire Type Ammonites*, Vol. I., (1911), Pl. XXXIX, A-C. The example in the Hull Museum (figs. 9g-h), shows the same widening mouth-border as *Microderoceras birchi* (J. Sowerby).

recapitulated by its supposed descendants, and nobody probably will now maintain that *Deroceras* is directly connected with any of the groups here discussed.

Now *Amm. capricornoides*, the forerunner of *Amm. planicosta*, with a similar reduced suture-line (fig. 8f) occurs already with *Microderoceras birchi*; and the *birchi* Tabular Limestone (Dr. Lang's bed 76 of the Dorset coast) is teeming with small ammonites, possibly including new Ectocentritid developments that, however, seem to comprise many morphological transitions between the true *birchi* (figs. 9a-f) and the true *capricornoides*. The *planicosta* stock, derived from the latter, and *Xipheroceras*, perhaps more closely connected with *Microderoceras* than with the *planicosta* group, are almost certainly two distinct stocks. *Xipheroceras* appears to end with the gigantic forms of the *rasinodum* type already in the *planicosta* zone; the *planicosta* group, for which the new name **Promicroceras** gen. nov.,¹ is now proposed, persists with slight changes from the *birchi* up to the *ziphus* zones. *Praderoceras* Dietz² (= 'Postderoceras' Schindewolf³), with the genotype *P. ziphus* (Hehl MS.) Zieten sp., *P. trimodum* (Dumortier⁴), *P. ziphoides* (Quenstedt),⁵ and a new Marston species, is sufficiently distinguished from *Xipheroceras* for the adoption of Dietz's name. The last stock might be taken to be connected, by its suture-line, with *Xipheroceras dudressieri*, which really does not fit into *Xipheroceras* any more than it does into *Promicroceras*. In spite of many stratigraphical surprises, we are, in the construction of our lineages, still too apt to look for biological continuity among the fragmentary ammonite material so far available.⁶

The phylogenetic scheme published by Frebold⁷ also probably represents the interrelations of the groups here discussed in far too simple a manner. There may have been repeated branching off a lytoceratid root-stock, but the internal suture-line alone, as used by Salfeld and his school, is scarcely

¹ Genotype: *Ammonites planicosta*, J. Sowerby, as here restricted = *Mineral Conchology*, Vol. II., Pl. LXXIII., fig. 5 only (B.M., No. C2235b)

² *Loc. cit.* (1923), p. 407.

³ 'Centralblatt f. Min.', 1923, p. 368.

⁴ *Loc. cit.* (III., 1869), p. 86, Pl. XV., fig. 1 (typus). The *Apodero-ceras* from Pabay, listed (*Geol. Mag.*, 1922, p. 550), as *A. aff. trimodum* was incorrectly determined.

⁵ Not to be confused with *Ophideroceras ziphoides*, Spath (see *supra*, p. 139).

⁶ Compare, for example, the fauna of the Monte di Cetona described by Fucini in *Pal. Italica*, Vols. VII.-XI. (1901-.05) which is far more representative of e.g., the Upper Asteroceratan age than the few known British forms.

⁷ 'Abspaltungen von *Lytoceras* im Unt. und Mittl. Lias,' *Mitteil. Mus. Stadt Essen*, Heft 2, 1923, Pl. I.

sufficient to settle our difficulties, as will be seen on comparing the internal lobe of *Microderoceras birchi* here figured (fig. 9f)¹ with that depicted by Frebold (Pl. II.). The internal half of the suture-line, of course, is as important as the external one, and it seems inconceivable that modern writers still neglect it in favour of many measurements that are both unnecessary with decent figures and misleading to workers of little experience. The Deroceratidæ, as Frebold assumes, are probably an independent offshoot of the fundamental *Lytoceras* stock, and the earlier genera here discussed may conveniently be separated as an independent family **Xipheroceratidæ**.

The restricted *Promicroceras planicosta* differs from *P. perplanicosta* (Spath=Wright's Pl. XXIV., fig. 3 only) in having closer costation and less exaggerated flattening of the ribs on the ventral area. *P. capricornoides* (Quenstedt) has costæ continuous across the periphery with a forward sweep, but almost no flattening,² and a similar but less compressed new form from Charmouth (*P. pyritosum* sp. nov. [fig. 8e], to be described separately) has ribbing almost as sharp as the late *P. nudum* (Quenstedt),³ though ventrally nearly as distinctly as on the sides. From the figures in Quenstedt and the examples in the British Museum (ex Zieten Coll.) above referred to (p. 299) it would appear that the *nudum* group includes various independent forms, of which Dietz's⁴ Heiningen specimen may be one; but *P. aureum* (Young and Bird) described by Simpson (under *A. planicostatus*, non *A. aureus* Simpson) as more slender than the southern examples,⁵ may be comparable to Quenstedt's slender varieties of *P. nudum*. In *P. marstonense* nom. nov. (fig. 8a-c = *A. planicosta* Sowerby, Pl. CDVI., fig. 7⁶ non LXXIII.), the common form of the Marston Stone, the growth is altogether more rapid, and the inner whorls are more distinctly ribbed, as in *P. nudum*, which, however, has the ribs bulging—*Gagaticeras* fashion—on the inner lateral area.

¹ The increased backward penetration of the internal and external lobes of some forms, compared with the umbilical lobes, appears to be regulated by the mechanical requirements of the septal surface as a whole, and is probably not of systematic value.

² The gradual increase in the size of the peripheral rhombs, compared with the scarcely thickened ribs of the early types, and the appearance, in the flattened areas, of a groove or grooves in the later forms, are useful diagnostic features in *Promicroceras*.

³ 'Cephalopoden,' 1849, Pl. IV., fig. 6; 'Ammoniten des Schwäbischen Jura,' 1884, Pl. XXI., fig. 6.

⁴ *Loc. cit.*, 1923, p. 400, text fig. 14a only.

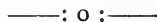
⁵ Three specimens of this form were presented to the British Museum by Martin Simpson in 1860 (Nos. 39688a-c). See also fig. 8d.

⁶ Very badly figured. Type to be an example in the Sowerby Collection, B.M., No. 43914b. Branco (*Palæontographica*, Vol. XXVI., 1880) apparently dissected an example of this species (Pl. X., fig. 4).

Xipheroceras appears to be unknown from Yorkshire, and the only examples of *Promicroceras* seen by the writer from that county belong to *P. nudum*¹ and *P. aureum*. They are associated with *Præderoceras ziphus*, almost indistinguishable from Zieten's type in the British Museum,² but to this species does not belong Blake's '*Amm. ziphus*,' already referred to in these pages³ by Crick. It is an *Apoderoceras* of the group of *A. retusum* (Simpson) S. Buckman sp.⁴

In the Marston Stone, *ziphus*-like forms⁵ are associated with a new species of *Præderoceras* like *P. trimodum* (Dumortier), *Asteroceras smithi* and *A. marstonense*, suggesting a higher horizon than the *margaritoides-dudressieri* assemblage of the Dorset coast, which has generally been identified with the true Marston fauna. Similarly the assemblage recorded by the writer from Skye⁶ includes late *Asteroceras* (including *Ast. margarita* Parona,⁷ another Yorkshire form), in addition to high-zonal *Promicroceras* and *Præderoceras*, but also *Xipheroceras* (and *Eparnioceras*?) of the *planicosta* zone; there is no evidence, however, of the presence of the *obtusum* zone in the restricted sense.

The connexion of *Xipheroceratidæ* with *Bifericeras* on the one hand, and *Gagaticeras* (and *Echioceratidæ*) on the other, I hope to discuss in a separate paper.



The Story of Copper, by W. Davis. London: T. Werner Laurie, 385 pp., price 12/6. The frontispiece to this volume consists of 'The Bronze Liberty Bell that announced the Declaration of Independence, and the Copper Goddess of Liberty, the colossal statue that guards New York Harbour,' and 'First Americans mixing copper'; and there is naturally a strong American flavour throughout the volume, T. Werner Laurie being the English publishers of this American volume. Throughout the author demonstrates the important part copper has played in the world's history, and especially in regard to the Great War. Among the illustrations selected to show the way in which copper has been used throughout the ages, it is gratifying to find an illustration of the 'Brass Sanctuary Knocker, now adorning the door of Adel Church, Yorkshire, which has served in England since Cromwell's time'!

¹ Blake's *Ægoceras planicosta*, referred to by Crick (*The Naturalist*, 1922, p. 275, B.M., No. C.19187), belongs to this species.

² One of the examples, marked 'Dr. O.,' among which Crick (*Geol. Mag.*, 1899, p. 554; 1900, p. 561; 1902, p. 47) recognised the types of *Amm. calcar*, *A. polygonius*, and *A. discoides* Zieten.

³ *The Naturalist*, 1922, p. 275.

⁴ *Yorkshire Type Ammonites*, Vol. II., 1913, Pl. LXXXII.

⁵ Sowerby's Pl. CDVI., fig. 6, already separated from *Amm. planicosta* by Oppel (*Juraform.*, 1856, p. 88).

⁶ *Geol. Mag.*, Vol. LIX., 1922, p. 172.

⁷ *Loc. cit.* (1896), p. 41, Pl. V., fig. 8; Fucini (*Cetona*, III., 1903), p. 133, Pl. XXXII., fig. 4.

GONIATITE ZONES IN THE KEASDEN BECK AREA.

JNO. HOLMES AND W. S. BISAT, F.G.S.

SOUTH of the Hellifield-Morecambe railway line, in the vicinity of Clapham, is a range of moorland country, composed of part of the Millstone Grit Series, and culminating about 4 miles south of the railway in the grit crags of Bowland Knotts, which are equivalent in horizon to the Pendle Top grit and succeeding grits. As one descends northwards from Bowland Knotts towards the railway, the beds of grit and intermediate sandy shales are seen to dip more rapidly than the streams, and to disappear from sight under a series of black fossiliferous shales. These shales are well seen in the two main streams, Keasden Beck and Kettles Beck, being exposed as scars in the banks of the streams. Their outcrop is coloured green on the 1" Geol. Survey Map as an indication of their fossiliferous nature, the fact of which has been known for many years, the beds being briefly described by Tiddeman in Y.N.U. Circular Supplement (Clapham), May, 1898.

Nevertheless, the fossiliferous beds of this area have remained practically unworked faunally, and not correlated with the better known exposures of the main mass of the Pennines, and the present paper records the facts disclosed by an examination last Easter of these fossiliferous shales. The discovery of several different fossiliferous horizons, including an interpolation of a brachiopod fauna in a goniatite sequence, and also of a distinct and unusual flora, appear to us to justify a certain measure of detail in the notes which follow. Some interesting facts on the persistence and uniformity of limestone bands and shales are also recorded, and indicate a distinct field for further research.

Keasden Beck displays very good sections in fossiliferous shales at intervals from Roger Scar, near its junction with the Wenning, upstream through Turnerford as far as the vicinity of Hawksheath Plantation, where the underlying grit comes up, and the fossiliferous shales are seen to rest on its uneven surface. Here the shales are well displayed, and are highly fossiliferous. They also contain numerous thin bands of limestone and lines of limestone nodules, which will be referred to again later. All the exposures of these fossiliferous shales in Keasden Beck are on the same horizon, which is marked by an abundance of *Anthracoceras glabrum*. This goniatite characterises at least 60 feet, and possibly as much as 100 feet of shale, and it is known that elsewhere, as in Scotland, its zone is a relatively thick one. Another goniatite occurs, an *Homoceras* of the *malhamense* group, but is comparatively rare. It is easily distinguished from *A.*

glabrum by its cadicone shape, wide umbilicus and different suture line. The associated fauna, which is most abundant near the base of the shales, includes *Orthoceras aciculare* and *O. koninckianum*, *Myalina peralata* and Posidoniellids of *laevis* and *corrugatus* type.

There is an associated flora, drifted in. The specimens so far obtained have been determined by Mr. Walton, of Manchester University, and include :—

Calamites sp.

Kettles Beck.

Lepidodendron rhodeanum (Sternb.) } Keasden Beck.

Sphenopteris clavigera (Kidston) }

Mr. Walton writes: 'Kidston has records of the *Lepidodendron* from 19 localities in the Carb. Lime. Series, and four from the Oil Shales, Calciferous Sandstone. The *Sphenopteris* is recorded from one locality in the Lower Limestone, Carb. Lime. Series of Scotland, and I have found a specimen at Teilia, Prestatyn, in the base of the Upper Black Limestone.'

The record of *Lepidodendron rhodeanum* from Anhée, from beds low in the Assise de Chokier (Renier 'Stratigraphie du Westphalien,' *Cong. Géol. Intern.*, Livret Guide XIII., Session 1922, Excursion C4, p. 23), is of interest, as suggesting the probable horizon of the Anhée beds, which are the lowest in the Upper Carboniferous of Belgium.

The above plant evidence, suggesting as it does correlation of the Keasden Beck shales with some part of the Carb. Lime. Series of Scotland, forms a striking confirmation of the correlation by means of goniatites. In *Proc. Yorks. Geol. Soc.*, Vol. XX., p. 56, it was stated 'The evidence [of *A. glabrum* and *E. bisulcatum*] suggests that the horizon of the Upper Limestone Series is high E, lying well above the top of the *crenistrina* zone (P), but before the entry of *diadema* (base of H).' This correlation by one of us of the Scottish Upper Limestone Series with part of the goniatite division E is now strongly supported by the Keasden Beck plant evidence. This result is in full accord with the trend of other lines of research, and the broad correlation may be regarded as fully established.

The Keasden Beck shale fauna most closely resembles that seen at the base of the Sabden Shales at Throstle Nest, Silsden; Edale, Derbyshire; and the Colsterdale Marine Band. There is no trace, however, in the Keasden Beck shales of the *Homoceras* with dichotomising striæ (cf. *nitidum*), seen in the Colsterdale Marine Band and elsewhere, and we suspect that these Keasden Beck shales may represent an earlier onset of Sabden Shale conditions than prevailed further east and north.

There is no doubt, however, that they form a shale series

corresponding to the Sabden Shales, for in Kettles Beck we found higher beds undoubtedly equivalent to those of the upper part of the Sabden Shales.

Passing eastwards from Keasden Beck, one sees the fossiliferous shales again in Hobson's Gill, as mentioned by Tiddeman in the Y.N.U. Clapham Circular Supplement (1898), and further east still in Kettles Beck. The exposures in Kettles Beck are more important than those of Keasden Beck, for in the former one may trace a succession of strata, and form rough estimates of the thickness exposed. The beds are best studied by entering the beck well upstream, west of Israel Farm, and then working downstream. Here a fine scar shews a section of fossiliferous shales, containing *Anthracoceras glabrum*, resting on grit, with a succession of limestone bands and nodules in the shales similar to that in Keasden Beck. A measurement of these bands was made in both becks, and it was found that there exists a remarkable uniformity in the thickness of the divisions as between one beck and the other. In Keasden Beck, however, there are a few feet more of shale at the base, which are not seen in Kettles Beck. In measuring the thickness and number of the bands no attempt was made at the time to compare or fit one section with the other, and the following are the untouched details, except that the divisions of the two sections have been placed in correspondence bed for bed :—

KEASDEN BECK.

Shales
Platy limestone, 9".
Shales, 3' 0".
Large nodular band (up to 12").
Shales, 4' 0".
Small nodules (4"—6").

Shales, 8' 0".
Limestone, 3".
Shales, 2' 0".
Nodules (6").
Shales, approx. 6' 0".
Nodules (6").
Shales, 1' 6".
Limestone, 6".
Shales, 2' 0".
Grit.

KETTLES BECK.

Shales.
Platy limestone, 9".
Shales, 2' 6".
Band of large nodules.

Shales, 4' 0".
Thin nodular limestone with streak of clay at top weathering light yellow.
Shale, 10' 0".

Limestone, 9".
Shale, 1' 6".
Grit.

The distance between the two sections is about $1\frac{1}{2}$ to $1\frac{3}{4}$ miles west to east.

Continuing downstream from the above section in Kettles Beck, higher beds in these shales come down into the stream, some 90 feet of the shales being seen until the sequence is cut short by a fault seen in the right bank. The last 25 feet or so of these shales are only feebly fossiliferous. The fault runs into the left bank further downstream at a bend in the beck, and here, on the west side of the fault, the basal portion of the fossiliferous shales is thrown up, together with a pinnacle of the underlying grit. No doubt the position of the bend in the beck is determined by this grit upthrow. Faulted against these shales and the underlying grit, lies in an undisturbed manner what appears to be the upper sandy portion of the same shales with a platy top reminiscent of the sections at Turnerford in Keasden Beck. These sandy shales are seen down to the confluence with Brow Side Syke, at first horizontal and then dipping gently downstream, platy sandstone coming in on the right bank 20 yards below Brow Side Syke, and continuing to just below the watergate, about 6 feet thickness being seen.

Sandy shales overlying these beds are seen obscurely for a considerable distance downstream, with one fine scar on the right bank exposing some 40 feet of beds. At a rough estimate there must be 150 feet of these sandy shales, leading up to a sandstone seen first in a scar on the right bank, and then again a little further downstream on the left bank at about 100 yards upstream from the road bridge above Silver Hills Plantation. This sandstone rests in a very irregular manner on the underlying shales, the sandstone being violently current bedded, and with a good deal of 'wash-out' phenomena, comparable with similar sections at the base of the Cayton Gill Series at Leighton Reservoir.

There is something suspiciously similar in Scotland in the Upper Limestone Series, where the Geol. Survey record (*Summary of Progress*, 1912, p. 61) the occurrence of a sandstone above the Gair (=Calmy) Limestone in the gorge of Avon Water, between Larkhall and Stonehouse, which 'has a very irregular base with ironstone nodules, and rests upon disturbed and eroded sandy fireclay and blaes.' The faunal evidence suggests that the horizons of these erosion lines in (1) Kettles Beck, (2) the base of the Cayton Gill Series, and (3) in the gorge of Avon Water, Scotland, are not very far apart in time, and it will be interesting to see whether future evidence supports the suggestion of contemporaneity. The Scottish erosion line is a little above the *Edmondia punctatella* band, which is widely spread in Scotland, and which should be looked for in England below *Homoceras diadema*, and above the base of the Sabden Shales.

To return to Kettles Beck. The above sandstone, together

with thin intermediate bands of plate and shale seen under the left bank at the upper entrance of the Silver Hills gorge, must be at least 50 feet thick, the upper part being well bedded and ganisteroid. This bed forms the top of the gorge sides in the Plantations. At the lower end of the gorge the sandstone exposure is suddenly cut short, and thrown eastward on the right bank by a fault which brings in sandy shale and plate on the left bank (apparently the intermediate plate, etc., mentioned above).

A further $\frac{1}{4}$ mile down stream brings us to a shale scar with a limestone band, both shale and limestone containing *Homoceras diadema*. These shales are probably not more than 20 feet higher than the above sandstone. One fossiliferous band is in rather sandy shale, and may be matched exactly both as to fauna and matrix with specimens obtained by Mr. Jackson from the River Noe, Edale, Derbyshire.

A further 200 yards downstream (100 yards above a footbridge leading to Low Kettlesbeck farm) gives a poor exposure in the left bank with obscure Homoceratids allied to *H. striolatum*. These beds are obviously well up in the Sabden Shale sequence.

Still further downstream, between the railway and the road, Tiddeman recorded (*op. cit.*) a calcareous bed with *Productus* and *Spirifer*. This should be looked for again, and collected from, as the horizon is obviously a very high one for such a fauna.

Working eastward from Kettles Beck, the next stream of importance is Black Bank Syke. This stream may be entered at the roadside bridge at Eldroth House, where a sandstone is seen in the stream. Working upstream, shales from under this rock come out opposite Rigghead, above the short plantation at about 500 feet O.D. They contain a large fauna, of which the most important member is *Reticuloceras reticulatum* (type form). Associated with this goniatite is a fauna strikingly reminiscent of the Eccup Shale fauna, which exposure lies in the same zone. The fauna includes fish remains, *Chonetes*, *Lingula*, *Nucula*, *Nuculana*, ? *Schizodus*, *Pleurotomaria*, *Orthoceras*, infrequent Posidoniellids, and a *Conularia* determined by Mr. Jackson as *C. quadrisulcata*.

Upstream a sandstone about 6 feet thick comes out from under these shales, with a thin band of micaceous shale containing *Productus* resting on it. Higher upstream still, and under this sandstone, are further plates and shales, one band of which just downstream from a hard band forming a water slide contains *Chonetes*. These beds are probably at the same horizon as the *Productus* bed found by Tiddeman in Kettles Beck and in the road at the hill south-west of Dubgarth.

Working further upstream, a grit, equal to the grit of

Knott Coppy, is passed through at the wooded gorge opposite Black Bank farmhouse, and underlying shales are feebly seen in the small streams into which the main stream now forks. The best exposure noticed is in the west branch stream opposite a barn at 610 feet O.D., where a shale scar yielded rarely small specimens of a *Reticuloceras*, either *R. inconstans* or an early form of *R. reticulatum* shewing ornament similarity to *Homoceras striolatum*.

Summarising the results, it may be said that at least four goniatite zones have been recognised in the shales exposed in these three becks, covering a thickness of perhaps 500 feet of strata, and forming an equivalent to the Sabden Shales, possibly with part of the overlying Kinderscout Grit represented at Knott Coppy. Between the zone of *inconstans* and the top of the overlying *reticulatum* zone, there is an interesting intercalation of a brachiopod fauna, reminiscent of the upper part of the Cayton Gill Series. Lower down in the series, in Kettles Beck, the sandstones of Silver Hills Plantation call to mind the feebly fossiliferous ganisteroid basal portion of the Cayton Gill Series as seen near Leighton Reservoir. Bearing in mind the occurrence in Kettles Beck of *H. diadema* above the sandstones, and the occurrence of the same goniatite in the ganister quarry at Congleton Edge associated with a large fauna of Cayton Gill type, this resemblance does make it seem feasible that the Silver Hills sandstone with its irregular base may well correspond to the base of the Cayton Gill Series. The *Chonetes-Productus* beds of Black Bank Syke may perhaps be correlated roughly with the top of the Cayton Gill Series, but may be higher. The absence of any marked lithological characteristic, or zonal fossil at this horizon, makes correlation hazardous.

The shales of the *A. glabrum* zone exposed in Keasden Beck, Kettles Beck and elsewhere should be searched vigorously for further specimens of plants, and an attempt made by searching in higher beds to find where the break between the Lower and Upper Carboniferous flora occurs. This is an important point to settle, as this dividing line is apparently the only really precise horizon furnished by the flora, and so far has not been definitely detected in the north of England. From analogy one suspects it to occur somewhere near the *diadema* zone, but unremitting fieldwork will alone settle the question.

In conclusion, we are much indebted to Dr. Lovett, of Clapham, for placing his knowledge of the district at our disposal, and for assistance in the field.

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The Geological Society of London has issued its *Abstracts of the Proceedings*, Nos. 1123-1138, 105 pp., at the price of six shillings.

CHILOTREMA LAPICIDA L. var. *CONVEXA* BAUDON.

HANS SCHLESCH.

ON June 21st, 1925, I spent the day collecting molluscs in the Beech woods of Kristinebjerg, Trelde, near Fredericia, in South-east Jutland, and found *Chilotrema lapicida* very common on the trunks of the trees growing upon and near the slopes along the Little Belt. Most of the specimens were very dark in colour (var. *nigrescens* Taylor) and very highly spired, being referable to the var. *convexa* Baudon, the specimens averaging 15 mm. in diameter and 9 to 10 mm. in altitude.

This form has also been described by Pascal as var. *pyramidata*, by Beäudouin as var. *elata*, and by other names by other authors, but has not hitherto been reported from Denmark.

I want to point out that it is not correct by Steenberg (Danmarks Bløddyr, I., 1911, p. 102) to give the measurements, diam. 15-18 mm. height $7\frac{3}{4}$ - $8\frac{1}{2}$ mm. for typical specimens. I have examined specimens from a number of localities and find they nearly all exactly measured 6 mm. in height, as given by Clessin (Excursions Mollusken-Fauna, 1884, p. 182).

Some of the specimens were referable to the var. *minor*, scarcely exceeding 12 mm. in diameter, while others, reaching 18 mm. in diameter, approached the var. *major* as described by Pfeiffer and other authors.

I also wish to record that on June 16th I found a fine specimen of the var. *albina* Menke in the wood of Klusris, near Flensburg in Schleswig.

All the specimens will be placed in the 'Schlesch' collection in the Hull Museum.

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The contents of *The Journal of Ecology* (Cambridge University Press, 18/- net) for September are of peculiar value to naturalists in the north. Professor F. E. Weiss gives his Presidential Address entitled 'Plant Structure and Environment, with special reference to Fossil Plants,' and this contains references to the Palæobotany of Lancashire and Yorkshire. Other contributions are 'Studies of the Vegetation of the English Chalk,' by A. G. Tansley and R. S. Adamson; 'The Technique of Research of Marine Phytoplankton'; 'Two Relict Upland Oak Woods in Cumberland,' by W. Leach; 'The Vegetation of the Forest of Wyre,' by E. J. Salisbury, and 'Notes of the Edaphic Succession in some Dune Soils, with special reference to the Time Factor,' by E. J. Salisbury. The editor, Professor A. G. Tansley, is to be congratulated on a well-printed and well-illustrated journal.

FIELD NOTES.

ENTOMOLOGY.

Vanessa antiopa at Woolley.—Captain Walker, of Woolley, tells me that about three weeks ago he was in the garden at Woolley Park when he saw a very large butterfly with dark wings with a white border to the wings. I showed him Morris's 'British Butterflies' yesterday, and he quickly picked out the Camberwell Beauty as being what he saw.—F. J. DUNDAS, Dale Cottage, Cawthorne, Barnsley, Yorks.

Coranus subapterus De G., new to Yorkshire.—On August 15th, 1925, I found a specimen of the Reduviid Bug *Coranus subapterus* DeG., in a sandy pit on Allershorpe Common, East Yorkshire. I was struck by its spider-like form when motionless, and very nearly passed it over as a large brown arachnid. The following day another specimen was obtained running over a bare patch among the heather on another part of the common. This interesting bug has not previously been found in Yorkshire, and the present record increases its northerly range on the East Coast in England—the previous most northerly record being from Lincolnshire, though it has occurred in Scotland and in Cumberland. The largest continuous area occupied by the species is south of the River Thames. The insect is predaceous upon lepidopterous larvæ, aphides and other small insects. Notes on its habits and life history, by Mr. E. A. Butler, will be found in *The Entomologist's Monthly Magazine*, 1918, p. 16.—W. J. FORDHAM.

Neuroptera, Trichoptera, etc., at Middleton-in-Teesdale.—The following species were obtained during the excursion of the Yorkshire Naturalists' Union to Middleton-in-Teesdale. I am indebted to Mr. G. T. Porritt for kindly identifying them. HUDESHOPE BECK (Durham), May 31st and June 2nd.—Perlidae (Stone Flies): *Taeniopteryx risi* Morton. (Mr. Porritt notes that this specimen is the best marked example he has ever seen.) This species was first taken in Yorkshire at Dunford Bridge by Mr. Porritt and the late Mr. McLachlan. It is common on moorland streams around Huddersfield, and probably occurs on the Yorkshire side of the Tees. *Chloroperla grammatica* Poda., *Isopteryx torrentium* Pict., *Nemoura cinerea* Oliv., *N. meyeri* Pict. and *Leuctra klapaleki* Kempney, all more or less generally distributed species. Hemerobiidae (Lace-wings): *Hemerobius atrifrons* McLach. (not common in Yorkshire). Trichoptera *Limnophilus sparsus* Curt. CRONKLEY (Yorkshire), by the river side, June 1st.—Perlidae: *Nemoura cinerea* Oliv., *N. meyeri* Pict., and *Leuctra klapaleki* Kempney. Trichoptera: *Limnophilus centralis* Curt.—WM. J. FORDHAM.

BOTANY.

Riccia fluitans L. at Askham Bogs.—During the visit to the Askham Bogs in June last, a quantity of *Lemna trisulca* was taken from the Chandler's Whin ponds, and placed in an aquarium tank. Nice growths of *Ricciocarpus natans* (L.) and *Riccia* (*Ricciella*) *fluitans* L. have since appeared, developing evidently from the material then collected. Arnold Lees, in 'The Flora of West Yorkshire' (p. 604), states that both these Hepatics are very rare in the county, and gives the Chandler's ponds as a locality for the *Ricciocarpus* but not for the *Riccia*.—JAMES M. BROWN, Sheffield.

Lactuca alpina Benth. in North-east Yorkshire.—On the 25th July last a friend in North-east Yorkshire, V.C. 62, brought to me from the district in which he lives a composite plant for identification. I had not seen the species before, but on reference to the books I had no difficulty in recognising *Lactuca alpina* Benth. I visited the place where it grows on the 3rd September, and found it in fruit flourishing at the bottom of a thorn hedge, and on both sides of the hedge, which divides a grass field from what was formerly an arable field, but has now been devoted to the cultivation of vegetables. The well-established plants of vigorous growth formed a patch about two yards long at the bottom of the hedge. I am told by an old resident in the district that *Lactuca alpina* has been known here for fifteen years, long before the field had been made into allotments or market garden, but its identity had not been determined. I sent a specimen to the Director of the Royal Botanic Gardens at Kew, and he confirmed my identification, and he requested me to send a good specimen for the Kew Herbarium. The London Catalogue of British Plants records that *Lactuca alpina* Benth. is known in two V.C.s. There can be no doubt that this plant has been introduced here in some way many years ago, but it is now thriving under truly wild conditions.—R. J. FLINTOFF, Goathland.

Tees-side Plants.—A short visit to the Yorkshire side of the Tees Estuary with Dr. J. W. H. Harrison revealed one or two interesting plants. *Erythrea pulchella*, a dwarf annual with dainty rose-pink flowers, occurred in a limited area with *Erythrea centaurea* in the drier parts nearby. The first named appears to be an addition to the North Yorkshire flora, as does *Juncus Gerardi* included in some of the floras as a brackish water form of *Juncus compressus*. A fine form of *Plantago maritima* the var. *latifolia* was seen. The locality visited is close to some large works put down during the war, from which molten slag is being tipped over ground which contained many rare plants recorded in the North Yorkshire flora.

Among those seen, some of which may soon be exterminated, were *Salicornia herbacea*, *Suaeda maritima*, *Statice limonium*, only one or two plants, the first seen by me in the locality which I have visited regularly for many years; it is placed on record for the locality in the North Yorkshire flora, but possibly the area it was likely to occur more freely in was covered with slag forty years or more ago; *Aster tripolium*, including white-flowered plants. The pretty *Astragalus hypoglottis* was coming up freely in sandy places that had been recently burnt off. *Erigeron acris* fairly plentiful on the slag bank tracks in which it seems to spring up spontaneously.—T. ASHTON LOFTHOUSE, Linthorpe, Middlesbrough.

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GEOLOGY.

Yeovilian Ammonites in Yorkshire.—Since writing the note on Yeovilian Ammonites in the Inland Area of the Yorkshire Moors (*The Naturalist*, August, p. 236), I have spent a few days at Danby and found specimens of *Phlyseogrammoceras*, which I have shewn to Dr. Spath for inspection, at two levels about seven feet apart on the Little Fryup quarry.—W. E. F. MACMILLAN.

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REVIEWS AND BOOK NOTICES.

The Anthocyanin Pigments of Plants, by Muriel Wheldale Onslow, M.A. 2nd ed. Cambridge University Press, 1925, 21/- net. It is gratifying that a second edition of this work has been called for, and to all interested in the functions of plants the incorporation of recent work in this edition will be welcome. The aim of the writer has been to indicate the significance of the pigments in relation to plant metabolism so far as the present state of our knowledge permits. As to the functions of Anthocyanins there are three main ideas: (1) that of shielding the chloroplastids from too intense sunlight, the 'light-screen' hypothesis; (2) assisting the action of diastase by screening it from injurious rays and thus assisting the hydrolysis of starch and subsequent translocation; and (3) that of absorbing certain light rays and converting them into heat rays. How far our knowledge carries us in determining the functions of anthocyanin may be gathered from the following sentence: 'It is difficult to find a hypothesis which would fit all cases of anthocyanin distribution without reduction to absurdity. The pigment is produced, of necessity, in tissues where the conditions are such that the chemical reactions leading to anthocyanin formation are bound to take place. For the time being we may safely say that it has not been satisfactorily determined, in any one case, whether its development is either an advantage or a disadvantage to the plant.' Practically all flowering plants produce anthocyanin, and when this pigment is developed in the flower it is seen that each specific type forms anthocyanin of a certain specific colour. Colour varieties, especially under cultivation, very commonly arise, and these have afforded plentiful material for mendelian research, and the concluding pages are devoted to an account of Antho-

cyanins and genetics. There is an extensive bibliography covering over ninety pages and including 879 references.—T.W.W.

The Life Story of a Badger, by J. C. Tregarthen. London : John Murray, xvi. + 152 pp., 6/- net. The author is familiar with the south-western extremity of these Islands, and it is well known that in that area the badger is a familiar mammal. The little book is written in a popular style ; there are illustrations, and a general account of earthstopping, etc.

Charnwood Forest and its Environs, by M. Paul Dare. Leicester : Edgar Backus, xiv. + 120 pp., 5/- net. In view of the increased interest being taken in geographical and historical work in this country, and especially in view of the peculiar interest attaching to the Charnwood Forest area, the appearance of the present work is very appropriate. It seems to have been carefully written, and the information given is reliable.

Man and His Superstitions, by Carveth Read. Cambridge University Press, 278 pp., 12/6 net. This work originally appeared as the second part of the author's book on 'The Origin of Man and of his Superstitions,' in 1920. In re-issuing the present section as a complete work the Cambridge University Press has placed an extraordinary interesting volume on the market. The chapters deal with Belief and Superstition, Magic, Animism, The Relations between Magic and Animism, Omens, The Mind of the Wizard, Totemism, and Magic and Science. There is an unusually complete and helpful summary of the chapters, and a good index.

The Fishes of the British Isles, by J. Travis Jenkins. London : F. Warne & Co., Ltd., vii. + 376 pp., 12/6 net. It is claimed by the publishers, and, we believe, correctly, that there is no modern book dealing with British Fish as a whole, though there are books dealing with various fish families, and freshwater fish. The present compact little volume is one of Warne's well-known Wayside and Woodland Series, and contains no fewer than 278 illustrations, of which 128 are printed in colours. With this volume on one's shelf there should not be any difficulty in identifying any species of fish to be found in or around the British Islands, and we cordially recommend it.

Animal Genetics, by F. A. E. Crew. Edinburgh and London : Oliver & Boyd, xx. + 420 pp., 15/- net. The present collection of essays by Dr. Crew forms one of a series of special monographs in connection with Biology, prepared by the University of Edinburgh. One naturally associates Edinburgh with work on Animal Breeding, particularly the wonderful work of James Cossar Ewart, to whom the present volume is dedicated. The chapters are devoted to The Factors and the Germ-Plasm ; Extensions and Modifications of the Mendelian Hypothesis ; The Material Basis ; The Genes and the Chromosomes ; The Nature of the Gene and the Expression of Genetic Action ; The Mechanism of Sex-Determination ; The Physiology of Sex-Differentiation ; The Sex-Ratio and the Question of its Control ; Exogamy and Endogamy ; The Genetic Aspects of Fecundity and Fertility ; Heredity and Disease ; and Disputed Beliefs. In addition there is an excellent Bibliography and Index.

A General Textbook of Entomology, including the Anatomy, Physiology, Development and Classification of Insects, by A. D. Imms, M.A., D.Sc. x. + 698 pages, and 604 illustrations. Methuen & Co., price 36s. net. This is really a splendid book ; primarily for students, but the advanced entomologist will find it a veritable dictionary of reference to countless matters which have slipped from the memory just at the moment when they are wanted. It is divided into three parts : I., Anatomy and Physiology ; II., Development ; and III., Classification.

Part I. treats of the Anatomy of the twenty-three orders into which the Insecta are divided; Part II. with the Embryology, etc.; and Part III. with the Classification. In all three subjects the minutest details are fully gone into, and the compilation of the book must have entailed a prodigious amount of labour on the part of the author. For the most part the information is thoroughly up to date, and incidentally proves what vast strides have been made in Entomological Science during the past thirty or forty years, most of the information given being the result of work done during that period. There are omissions, as for instance, although the author (p. 9) alludes to the late Hon. H. Onslow's experiments as to the cause of iridescent colours on the wings of lepidoptera, published in 1921, no mention is made of the very little more recent work of Dr. E. A. Cockayne, who has probably considerably advanced our knowledge of the subject. We notice, too, one or two statements regarding lepidoptera, which seem open to question. For instance, in the chapter on the Egg (p. 402) it is stated that the duration of the egg state of *Acidalia virgularia* may be as short as two days. In our long experience in such matters, we have never known any macro lepidopteron in which the egg state lasted so short a time as that, and we think that probably some mistake has been made about it. Then, at page 426, we are told that the female of *Hepialus hectus* 'discovers the male by means of an odour diffused by the latter.' It is generally acknowledged that scent from the female attracts the male, but we have never seen any evidence that the male also gives out scent for sex purposes. The female of *Hepialus humuli* also seeks the male, but in that case it is generally assumed that it is by sight, and that the pure white wings of the male (as against yellow with red markings in the female) are an aid in that direction. We think it probable that the female of *H. hectus* finds her mate in the same way, for although the female is usually less brightly coloured than the male, whenever both species occur they are so abundant that the female will have no difficulty in mating. Or it may be from vibration of the atmosphere caused by the wings during the curious oscillating flight of the males. *H. humuli* selects her mate whilst he is on the wing, and probably *H. hectus* does the same. The arrangement of the Orders is pretty much as we have become accustomed to in recent years. Twenty-three orders are recognized, and the only difference between Dr. Imms' arrangement and that of Dr. Carpenter (whose book we noticed in this journal some months ago) is that he gives Corrodentia under Psocoptera; and the Mallophaga become part of the Anoplura. The keys to the various families are most clear and valuable. As indicating the relative number of British species of Insects to those known throughout the world, it may incidentally be stated that Dr. Imms tells us (p. 456) that the Coleoptera (the largest order in the animal kingdom) number approximately 180,000 already described species, of which about 3300 inhabit the British Isles. The only fault we can find with the book is, that for a students' class-book it is too heavy (it weighs $3\frac{1}{2}$ lbs.), but this we suppose could only have been avoided by a reduction in size of the very excellent type, and of the equally good illustrations, which would have been a much greater evil. The book should certainly be in every public library in the kingdom.—G.T.P.

A Catalogue of British Scientific and Technical Books. New ed. London: A. & F. Denny, 489 pp., 12/6 net. Every librarian and many others must be grateful to Sir Richard Gregory and his helpers of the British Science Guild for the admirable compilation of nearly 10,000 titles of technical and scientific books. The volumes are classified under various heads, and the present edition contains about three thousand more entries than appeared in the last issue. There are yet a few names we should hardly expect to see in a work of this character, and some, including our own, which we expected to see and do not! Notwithstanding, we have great pleasure in recommending the publication.

NEWS FROM THE MAGAZINES.

W. E. Clegg describes 'The Nest of the Avocet' in *British Birds* for September.

H. J. Burkill gives the result of 'Experimental Work on Oak-Galls of the Cynipidæ' in *The Entomologist* for September.

According to *The Museums Journal*, a talk on Leicester through the centuries has recently been given at the Lincoln Museum and Art Gallery.

The Journal of the Architectural, etc., Society for Chester (N. S., Vol. XXVI., Pt. 1) contains a valuable 'Report on Roman Potters' Marks found in Chester,' by A. G. K. Hayter.

The Journal of the Manx Museum for September, besides an account of many interesting objects in that Institution, has notes on the Glaucous Gull; Teredo; Rudolphi's Rorqual, etc.

Mr. Riley Fortune, F.Z.S., writes on 'Peregrine Falcons in Yorkshire, A Bird of Prey and Its Curious Habits—Day and Night Observations' (with photographic illustrations) in *Yorkshire Homes* for September.

The Lancashire and Cheshire Naturalist for September is full of local news, reports and records. Seth Lewis gives Palæo-Botanical Notes; T. W. Holt lists some Cheshire Plants, and there are lengthy reports of field meetings of the Liverpool Botanical Society.

The Murrelet for May, issued by the State Museum, University of Washington, for the Pacific North-west Bird and Mammal Society, contains an account of the killing of a boy by the Mountain Lion, or Puma, usually looked upon as a cowardly animal.

'A Study on Parasitism in the Cuckoos,' by Rev. F. C. R. Jourdain, appears in *The Proceedings of the Zoological Society of London* recently issued. It is accompanied by some remarkably beautiful coloured plates of parasitic eggs of cuckoos, and hosts, as well as of nestling cuckoos and hosts.

Illustrated by a wealth of maps and sections, Dr. C. T. Trechmann describes 'The Permian Formation in Durham,' in *The Proceedings of the Geologists' Association*, issued on 21st August. The same publication contains a Report of the Excursions arranged by the North-east Lancashire Group, 1924, by E. W. J. Moore.

In his report on the Animal Remains found at the cave known as Mother Grundy's Parlour, Creswell, Derbyshire, excavated by Mr. A. L. Armstrong, Mr. J. W. Jackson records (*Journ. Royal Anthropol. Inst.*,) the mammoth, rhinoceros, hyæna, lion, wolf, fox, bear, bison, reindeer, red deer, horse and man. There are also several molluscs.

Nature, No. 2911, contains a report on the recent conference of the Museums Association at Exeter, held under the Presidency of Mr. F. R. Rowley. The same journal (No. 2912) gives 'Provisional Programmes of Sections' in connexion with the Southampton meeting of the British Association, with the exception of those for Section C (Geology) and D (Zoology).

Among the contents of the *Journal of the Royal Anthropological Institute*, Vol. XV., we notice 'A Flint Chipping Floor at Aberystwyth,' by R. Thomas and E. R. Dudleyke; 'A Contribution to the Study of Eoliths,' by F. W. Jones and T. D. Campbell; and 'Excavations at Mother Grundy's Parlour, Creswell Crags, Derbyshire, 1924,' by A. L. Armstrong.

The National Association of Medical Herbalists of Great Britain, Ltd., has issued part I. of its new organ, *The Medical Herbalist* (28 pp., 3d.). Among the articles we notice 'Some Medicinal Plants of Leicestershire,' by Charles Lakin; *Scrophularia* or Figwort; Bernard Shaw on Doctors; Peppermint and Elder flowers; etc. There is a report of the 61st Annual Conference held at Leicester. The Editor is Mr. W. Burns Lingard, 194 Pellon Lane, Halifax.

NORTHERN NEWS.

The death is announced of Sir Francis Darwin, F.R.S., D.Sc., in his seventy-eighth year. He was the third son of Charles Darwin.

We understand that the Museums Association has offered the Presidency for 1926-7 to Mr. J. A. Charlton Deas, Curator of the Museum at Sunderland, and that Mr. Deas has accepted.

We notice that the University of Leeds, in association with the Leeds Philosophical and Literary Society, has issued a joint programme of public lectures and music for the autumn term.

During the winter months the Leeds University has arranged a course of ten lectures on Astronomy by Mr. R. Stoneley. Full particulars of these may be obtained from the Registrar, The University, Leeds.

We regret to notice the death of Mr. D. F. Douglas, of Ilkley, at the age of 66, who was interested in all kinds of sports, was a good shot and keen angler. For many years he was a member of the Yorkshire Naturalists' Union and took an interest in its work.

A daily illustrated paper recently reproduced photographs of 'the trunk of an ash discovered embedded in the rock' at the Portland Stone Quarries, and of a large ammonite, which is labelled 'a "conger eel" fossil—(D.S.)'; the letters in parenthesis doubtless being the editor's way of saying D— Silly!

In view of the somewhat alarmist reports in a certain section of the press recently in reference to the erosion of the Holderness Coast and its dangers (one report even stating that a slice of land a mile long and twenty yards wide has recently been removed), it is good to find a reasonable record of the state of things in *The Yorkshire Post* for the 22nd September, from a Special Correspondent, who has visited the site. It would appear that nothing out of the ordinary has taken place in recent years.

We have received Part I. of *The Parnassian*, the organ of the International Institute of British Poetry and Calder Valley Poets' Society, from which it is apparent that the Calder Valley 'Rhymesters busy as bees' can keep their place in the sun. There are numerous poems, among them being 'The Cuckoo's Song,' by Winifred Fielden; 'Give me the Winding Path,' by Matthew Barr, and 'Joyous Spring,' by A. M. Workman. The payments for the year exceed £100, slightly more than the receipts.

A fine collection of British butterflies and moths, with the cabinets in which they are contained, formed by the late J. W. Boulton, the stonemason naturalist of Hull, have been presented to the Hull Museum by his widow and son. The collection is remarkable for the neatness with which the specimens have been arranged, for the care in the selection of varieties, and particularly for the large number of preserved larvæ, in connection with which Boulton's success in their preservation was known throughout the country.

What seems to be rather awkward for those who 'date' flints by their shapes and workmanship, is a note in *Man* for September on 'A Thames Pick of Iron Age Date,' by Mrs. M. E. Cunliffe. She says 'The flint is of a pale bluish grey, the unground sharp nose shows no sign of use, and the whole surface is as sharp and rough to the touch as a newly knapped flint, as no doubt it was, when buried in the pit. Implements of 'Thames Pick' type, it seems, are usually regarded as of late Palæolithic or early Neolithic date, but the circumstances in which the Casterby example was found shows that they continued to be made in Britain well into the Iron Age.'

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JOHN W. TAYLOR, M.Sc.

RILEY FORTUNE, F.Z.S.

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NOTES AND COMMENTS.

HULL GEOLOGISTS.

The Hull Geological Society is to be congratulated on the completion of the sixth volume of its *Transactions*.* The fifth and last part, just published, is especially noteworthy for valuable records and discussions of the local Pleistocene deposits. Mr. Lamplugh, in his Presidential Address on Kelsey Hill, Kirmington, and other Drift Problems, concludes that the evidence of the coast sections between the Humber and the Tees indicates that the basin of the North Sea in these latitudes was occupied by an ice-sheet continuously from the beginning to the end of the production of the Yorkshire boulder-clay series. There were only irregular and partial recessions of its margin. An especially elaborate section of the deposits from Harland Rise, Cottingham, to Great Culvert, Sutton, is given by Mr. C. B. Newton. A belemnite-bearing clay on the foreshore at South Ferriby is also being examined by several members of the Society, and a preliminary report by Mr. T. Sheppard suggests that the deposit includes the various beds of the Kimmeridge and Speeton Clays which are represented at Speeton. The Society, indeed, was never more active, and its published papers maintain the highest standard.—A. SMITH WOODWARD.

DATING FLINT IMPLEMENTS BY COLOURS.

In a paper on 'Colour and other Changes in the Flaked Surfaces of Flint,' appearing in *Science Progress* for October, Mr. J. R. Moir states 'If a large series of flint implements, comprising examples of every prehistoric culture found in England, be examined, it will be seen that, speaking generally, the specimens can be divided up into three distinct groups, by the different colours exhibited by their flaked surfaces. These groups are (*a*) implements that range in shade from a dark mahogany brown to a light chestnut brown, (*b*) specimens that show either a streaky coloration of black and white (the well-known "basketwork patination") or a dense blue or white, and (*c*) implements that exhibit the unchanged colour of the original flint. Such an examination will show, also, that this grouping of the specimens, according to their colour, has grouped them, moreover, according to their types, and that those showing coloration (*a*) are of Eolithic, Pre-Chellian, Chellian and Early Acheulian forms; those exhibiting coloration (*b*) are of Late Acheulian, Mousterian and Upper Palæolithic types; while those showing coloration (*c*) are referable to the Neolithic period.'

* Vol. VI., Pt. V., 1922-25, with Title, etc., edited by T. Sheppard, pp. 259-296, 5/-.

WOODCUTS OF BRITISH BIRDS.*

In this large quarto volume the author brings together a



number of woodcuts of British birds, some, such as that of the heron, being quite 'eerie.' The twenty woodcuts are printed on sheets of paper unmarred by descriptive letterpress, and

* By E. Fitch Daglish. London: E. Benn, Ltd., 164 pp., 25/- net.

each is accompanied by three or four pages of useful matter relating to the particular species portrayed. In order that our readers may get a better idea of the collection of illustrations, the publishers enable us to reproduce one of the smaller ones (The Dipper), herewith.

SCIENTIFIC PERIODICALS.

In discussing the question of Scientific Periodicals, in *Science Progress* for October, the Editor states 'On considering the matter as a whole, however, we are inclined to think that the vast bulk of this alleged scientific literature is almost worthless, or, if it be not worthless, it appeals only to specialists who are easily able to trace papers which concern them directly without troubling to "look up" the literature in such a public library. Most scientific articles are merely confirmatory of previous ones. Our experience suggests the following proportions, namely, that 5 per cent. of the published papers are valuable, that 90 per cent. of them are of no value, and that another 5 per cent. of them are spurious—that is, they are incorrect or describe work that has never really been done. Science is tending to smother itself with its own excessive output of worthless or bad work, and we fear that minute cataloguing of all this literature would only help to make confusion worse confounded. Time is the great clarifier; and, though good work is sometimes lost, bad work is more often excluded from remembrance by the oblivion which it deserves. What is really required is a limitation in the amount of trivial or spurious scientific literature.'

PROTECTION OF THE BADGER.

Recently a 'badger dig' was held on the banks of the Jed, near Jedburgh, during which seven badgers were killed. A photograph showing the corpses of these poor brutes, with the vandals who committed the dastardly outrage, has been published in many papers. This has aroused the wrath of the Selborne Society, and through their Secretary, they have issued a strong protest against this vandalism, and at the same time advocating a firmer protection of the badger. With this all naturalists will be in sympathy. Badger-baiting was made illegal by Act of Parliament in 1850. One, therefore, wonders why such slaughter should be allowed in these enlightened times. For some time these animals have been accorded a measure of protection, but this seems to be breaking down, and a perfect epidemic of destruction is taking place all over the kingdom. One particularly mean proceeding is that practised by the various hunts in the country, who, every year, destroy a number with their hounds. Yorkshire packs are great sinners in this respect. The hunt should have the greatest sympathy for the badger, for he is a harmless

and inoffensive animal, and provides many good earths for the fox. Nowadays there seems to be a perfect clamour for the destruction of many interesting animals and birds, and it is quite time that some effective means was devised to put a stop to the cruel and unnecessary slaughter.

THE LEEDS UNIVERSITY.

The University, Leeds, is making a strong appeal for £500,000 for urgent and necessary extensions, etc., and has gone about the matter in a thoroughly business-like way, and already has received a substantial sum towards that very large amount. We trust that the strenuous effort now being made will meet with every possible success.

SCIENCE IN 1684.

In the interesting notes on 'Early Science at Oxford,' now appearing in *Nature*, under date October 7, 1684, we learn that there was communicated 'an abstract of a letter, sent by Mr. Todd, dated September ye 7th, from Rose Castle in Cumberland, concerning a salt spring and another (Minerall) spring near Durham; as also concerning some Roman Urns, which he promises to send us. Mr. Todd says in this letter that as he traveld over Stane-Moor in Yorkshire, he observ'd ye River Greatah (which is about half as big as the Charwell) run underground for about a mile, so that he, and his company past over it drye foot. The passage underground is but narrow; so that in winter, when the streams are high, it keeps ye channell above ground.

CURE BY COLOURS.

We learn from the press that: 'Remarkable possibilities in the treatment of all kinds of ailments by the use of different shades of light were outlined to a *Daily Mail* reporter by Lord Clifford of Chudleigh, who for many years has been studying the action of coloured light upon the growth of vegetation. All the colours of the spectrum may be utilised for different complaints, and in future doctors may describe their patients by their colour rather than by their symptoms, said Lord Clifford, who added:—One shade of red is the most effectual in all cases of blood-poisoning. Ultra-violet produces a fermentation in the body which reduces hardness of tissue and also builds up blood tissues. A particular shade of violet causes the growth of bone; an indigo produces hydrocarbonates and body tissues; a shade of blue produces muscular generation and strength; a shade of green increases the vitality and general energy of the system and also the growth of fat; yellow restores the nerves. But, of course, the greatest care must be taken that only the right shade of each colour is used or opposite results may be obtained. The treatment would also benefit most people suffering from

premature old age and mental worry produced by past illnesses. I do not claim that it can make people of 60 feel like 35, but it certainly can restore them to the state of activity and fitness they enjoyed a dozen years before. I hope that the new method will eventually lead to a cure for consumption.' To add 'colour' to the story, a portrait of Lord Clifford is given: personally we would rather have seen a little evidence for the statements made. 'See any green?' and 'strike me pink' may yet have some scientific significance!

UPPER KIMMERIDGE AMMONITES.

At a recent meeting of the Royal Society of Edinburgh, Mr. E. Neaverson read a paper on the Ammonites from the Upper Kimmeridge Clay. The Upper Kimmeridge Clay includes a variable series of clays and sands lying between the Gravesia zones of the Lower Kimmeridgian and the base of the Portland Stone Series. The zonal sequence is here tabulated with equivalent stratigraphical terms:

- | | | |
|-----------------------|---|---|
| 5. pallasoides zone | } | Hartwell Clay. |
| 4. rotundum zone | | |
| 3. pectinatus zone | | Swindon Sands; Oil Shale of Kimmeridge. |
| 2. nodiferous zone | } | Kimmeridge Clay (in part). |
| 1. Wheatleyensis zone | | |

The ammonites have hitherto been grouped under the name *Ammonites biplex* which, as Lamplugh pointed out thirty years ago, is useless for stratigraphical purposes. Though the forms found in the Hartwell Clay are familiar (but undescribed), those in the lower two zones are practically unknown in literature, and none has previously been described or figured. Some of these ammonites have been recognised in the Upper Kimmeridge Clay (*sensu anglico*) of Boulogne, but their identity with Russian forms (suggested by Pavlov and others) is not accepted. Indeed, palæogeographical considerations seem to indicate that the British and Russian areas were not in direct communication during the period when these ammonites flourished.

BRADFORD NATURALISTS.

The Bradford Natural History and Microscopical Society, and the Bradford Scientific Association have recently had a successful series of celebrations, in honour of the Jubilee of both Societies. As a permanent record, 'Fifty Years of Local Science, 1875-1925,'* edited by H. J. M. Maltby and W. P. Winter, has been published in pamphlet form. Besides details of the various officials, etc., during the half century, there are chapters dealing with the fifty years of progress in the

* Bradford: T. Throup. 33 pp., price 6d.

district, under the heads of Physics and Chemistry, Geology, Zoology, Geography, Engineering, Physiology, Botany and Education, each written by an expert in the particular branch. In addition, Mr. H. B. Booth writes on 'Vertebrate Zoology : The Change of Status of the Vertebrates near Bradford during the fifty years, 1875 to 1925.' In connection with the celebrations there was an exhibition of scientific objects, together with demonstrations of biology, and other scientific phenomena. This was held at the Technical College, Bradford, and illustrated the various aspects of work of the two societies. The exhibition was opened by Mr. J. A. Guy, Chairman of the Bradford Education Committee, and was particularly instructive, and short lectures on natural history subjects were given during the day.

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Messrs. Murby & Co. have published **Local Geography : A Guide with Sources of Information**, by **C. G. Beasley**, 24 pp., 1/6. The author is the head of the Department of Geography at the University of Nottingham, and his pamphlet is supplementary to that on local Geology by Dr. Morley Davies, recently published by the same firm. Teachers of Geography, and particularly those in the Nottingham area, will find it very useful.

The Flower Seeker, by **Forster Robson**. London : Cassell & Co., viii.+184 pp., 3/6 net. This handy volume is light, easily fits into the pocket, and will be found very useful to beginners anxious to know the names of the commoner wild flowers. The arrangement is quite good, and with the help of the volume we do not think there should be difficulty in identifying any of the ordinary flowers likely to be met with on a country ramble.

Bee-keeping Do's and Dont's, by **Tickner Edwardes**. London : Methuen & Co., viii.+56 pp., 2/6 net. Probably few know more about Bee-keeping than the author of the present little work, which is thoroughly practical, and gives hints on Bee-keeping, Spring, Summer, Autumn and Winter Management of Bees, and Diseases of Bees. He concludes by sensible advice : 'Keep nothing but strong stocks headed by vigorous young queens of good strain, and keep them dry and warm at all seasons, and you will have little to fear from disease of any kind.'

Jungle Days, by **William Beebe**. London : G. P. Putnam's Sons, v.+201 pp., 10/6 net. The work is by the author of the sumptuous volume on 'Galapagos,' which was noticed in these columns last year. Mr. Beebe deals with various aspects of jungle life, vegetable and animal, in an entertaining way ; and gives illustrations of the scenery, fauna and flora ; his final chapter being on 'The Tinamou, the bird with the Wine-coloured Egg.' Mr. Beebe's narrative is well written, and draws attention to many curious natural history features in the tropics.

Game Trails in British Columbia, by **A. Bryan Williams**. London : John Murray, xiv.+360 pp., 21/- net. Mr. John Murray has added still another to his interesting collection of books on travel and big-game hunting, and has produced a work in his usual thorough manner, with plenty of illustrations. The author deals with the various species to be encountered in the wilder parts of North America, and gives an admirable account of the changes in the country and its game since the days of the early prospectors. Special attention is given to the fur-bearing animals, to fish, etc. Altogether the book forms a valuable addition to the literature of sport.

NOTES ON YORKSHIRE AMMONITES.

DR. L. F. SPATH.

VII.—ON *AMMONITES SEMICOSTATUS* YOUNG AND BIRD.

Promicroceras planicosta (J. Sowerby) dealt with in the last chapter and *Eparnioceras* of the '*semicostatum*' type having now been found in the same bed, it may be useful to discuss another famous Yorkshire species, namely, *Ammonites semicostatus*, Young and Bird,¹ described, but very inadequately figured, nearly a hundred years ago. Wright² was again unfortunate in the selection of his figured examples of this species, but there is not a palæontologist who ever referred to the present form without falling into some error; and the present writer discussed it on at least three occasions. The specimens depicted by Wright are all specifically different from Young and Bird's form, and it is as doubtful whether his early Gloucestershire species occurs in Yorkshire, as whether the two late Lyme Regis forms have ever been found in that county. Yet Wright probably examined specimens of the true *Ammonites semicostatus*, which he called 'a very common shell on the Yorkshire Coast,' and it is interesting to note that he stated this to be associated, at Lyme, with *Arietites turneri* and *Ar. 'bonnardi'* (= *Ar. pseudobonnardi* Spath), the latter found in the same slabs with *Microderoceras birchi*.

Hyatt,³ in 1888, started off with the extraordinary statement that 'no such species [*Ammon. semicostatus*] was described in Young and Bird's "Geology of Yorkshire," p. 257,' meaning clearly the first (1822) edition. But Hyatt apparently correctly interpreted the present species in his var. A., which includes the typical example figured in Pl. II., fig. 10, with rounded inner whorls, and the form of Pl. II., fig. 16, which is closer to the type figured by Blake⁴ as *Arietites difformis* (Emmrich), wrongly included by Hyatt (p. 169) in the synonymy of *Arnioceras bodleyi*. The varieties B, C, and D of Hyatt, however, do not belong to the present species.

Young and Bird's statement that *Ammon. semicostatus* often occurred in large clusters may have helped authors more than the original figure or description. Mr. C. Thompson⁵ drew attention to the abundance of these clusters of *Ammon. semicostatus* in the Holderness Drift, of which he thought it

¹ 'Geological Survey of the Yorkshire Coast,' second ed. (1828), p. 257, Pl. XIII., fig. 10.

² *Loc. cit.*, pt. 1 (1878), Pl. I., figs. 4, 5, 7, 8.

³ 'Genesis of the Arietidae,' *loc. cit.* (1888), p. 165.

⁴ 'Yorkshire Lias,' 1876, p. 289, Pl. VI., fig. 3.

⁵ *Quart. Journ. Geol. Soc.*, Vol. LXIX., 1913, p. 173.

might be styled 'the ammonite.' But the earlier *Arnioceras* of the *acuticarinatum* type occur in similar masses, and are also associated with a smooth form. Even now, therefore, after Mr. Buckman¹ has re-figured the presumed holotype in the Whitby Museum, identification of the species is not easy to those unable to compare their examples with such clusters of topotypes. It will also be seen that such unusually 'delayed' forms as the type, with a prolonged smooth stage, are uncommon, and that the majority of examples are intermediate in ribbing between this type on the one hand and the delicately costate form figured by Blake as *Arietites difformis* on the other. Blake's *Ar. semicostatus*,² however, does not belong to this group and probably not the same bed; for, like the associated and equally poorly preserved malformation previously³ referred to (= *Arietites pauli* Dumortier, in Blake), it has a certain resemblance to Quenstedt's *Arnioceras densicosta*⁴ suggesting the *acuticarinatum* zone. In view of the large number of species of *Arnioceras* already described, especially from Italian deposits, it seems inadvisable to name Blake's examples, and, unfortunately, the Yorkshire succession of *Arnioceras*-bearing beds may have to remain altogether doubtful, for Mr. Thompson has already suggested that all the museum material has been obtained by collectors from the Drift, the beds not being found anywhere *in situ*.

On the other hand, *Eparnioceras* has now been found associated with *Promicroceras*, and at least one of the examples previously recorded,⁵ though immature, seems to be referable to *P. capricornoides*, which occurs already in the *birchi* zone. In the neighbourhood of Mezières, France, M. G. Dubar, as has already been stated (p. 265), mentioned the occurrence together of '*Ægoceras planicosta*' and '*Arnioceras ceras Hyatt*'; and though these were found in phosphatic nodules, suggesting secondary derivation, their occurrence above his 'horizon of *Zeilleria perforata*' indicates a fairly late date in the Upper Sinemurian. In the last chapter the writer also mentioned that one of Wright's examples of *Xipheroceras dudressieri* (Pl. XXIV., fig. 4) was associated, in the same block, with *Eparnioceras flavum*. It is reasonably certain that the specimen in which are embedded the two Lyme Regis examples of *Eparnioceras* figured by Wright is from the same bed (*planicosta* zone). Among Dr. Lang's Dorset material I have now recognised *Eparnioceras flavum* associated

¹ 'Yorkshire Type Ammonites,' Vol. II., 1918, Pl. CXII.

² *Loc. cit.* (1876), p. 288, Pl. VI., fig. 4a (upper figure).

³ Spath, *Proc. Geol. Assoc.*, Vol. XXXV., 1924, p. 207.

⁴ *Loc. cit.* (1884), Pl. XIII., fig. 7.

⁵ B.M., No. 62370. See *Quart. Journ. Geol. Soc.*, Vol. LXXIX., 1923, p. 71.

with *Promicroceras* of a peculiar, delayed—except in periphery almost *semicostatum*-like-type and *Asteroceras* sp. cf. *confusum*, not yet found anywhere in place, but probably from the *obtusum* zone. There seems to be no doubt now that, as I stated on a former occasion,¹ Wright's *Arietites semicostatus* (Pl. I., fig. 8), which was taken as genoelectotype of *Eparnioceras*, was different from Blake's and Young and Bird's Yorkshire forms. The Dorset species thus requires a new name (*Eparnioceras semicostatoides*, nom. nov.), and it is its occurrence together with smooth forms that has misled many workers, including the writer.

Eparnioceras does not seem to occur in Yorkshire any more than *Promicroceras* of the early *capricornoides-planicosta* type or true *Xipheroceras*. The presence of the *obtusum* and *planicosta* zones has thus still to be demonstrated.



FIG. 10.

Suture-lines of *Arnioceras* and *Eparnioceras*: (a) *Arnioceras semicostatum* (Young and Bird), Robin Hood's Bay (B.M., No. C.86a), at diameter of 45 mm. (\times about 3). (b) *A. nigrum* (Blake), same locality (B.M., No. 50150c), at diameter of 17 mm. (\times about 4). (c) *A. nodulosum* (J. Buckman); Gloucestershire (L. F. S. Colln.), at diameter of 18 mm. (\times about 5). (d) *Eparnioceras semicostatoides* sp. nov., Lyme Regis (B.M., No. C.2912a, and C.6121a, composite, \times about 3). (e) *Eparnioceras flavum* (S. Buckman), from same slab (C.2912b), with *Promicroceras* cf. *planicosta*, at diameter of 15 mm. (\times about 4). (f) *Arnioceras geometricum* (Oppel), at whorl height = 4.9 mm. (after Dietz, 1923, p. 433, text-fig. 27 (pars.).

The suture-lines of both *Eparnioceras semicostatoides* and *Ep. flavum* are here figured (figs. 10d, e) for comparison with those of *Arnioceras semicostatum* (fig. 10a) and *A. nigrum* (fig. 10b), each pair occurring together in the same slabs. The suture-line of one of the nineteen Warwickshire examples of *Arnioceras nodulosum*, referred to in a previous paper,²

¹ *Proc. Geol. Assoc.*, Vol. XXXV. (1924), p. 207.

² Spath, 'Notes on Ammonites,' *Geol. Mag.*, 1919, p. 69.

and of a specimen of *Arnioceras geometricum* (Oppel), after Dietz,¹ are also given (figs. 10c and f). The suture-line is very variable in all species of *Arnioceras*, as has already been mentioned,² and by itself does not seem to help in the differentiation of *Arnioceras* from *Eparnioceras*. It is sufficient to compare in this connection the suture-lines here figured with those of the many Italian species illustrated by Fucini³ or of *Arnioceras ceras* Giebel (= *A. ceratitoides* Quenstedt sp.), figured by Hauer⁴ in 1856. In smooth *Eparnioceras*, however, of the *flavum-anageneticum* type, the more definitely separated keel is an important diagnostic feature, and a similar compressed and keeled stage, with the costation already developed, distinguishes *Ep. semicostatoides* from the earlier *Arnioceras*. This tendency to sharpen the ancestral *Ammonites*-periphery is fully expressed in the genus *Hypasteroceras* (see Fucini's⁵ Pl. XXIII.), which thus may have to be included in *Arnioceratidæ*. Biological speculations based on the presence of a prolonged smooth stage in *Eparnioceras* have thus received anything but support from the results of detailed collecting.

Mr. Buckman⁶ wrongly considered Hyatt's *Arnioceras semicostatum* (Pl. II., fig. 10, above referred to) as something similar to his *A. anageneticum*, and stated that nothing like either had been figured from Wurtemberg; but it seems to the writer that Quenstedt's *Eparnioceras lævissimum* has the same type of keel as the three Dorset species *Ep. semicostatoides*, *Ep. flavum* and *Ep. anageneticum*, and that it differs from the last only in the width of the umbilicus (44 per cent., not 51 per cent.). The micromorph *Arnioceras miserabile* (Quenstedt) with angular periphery on the other hand is as distinct a species of the *acuticarinatum* zone as *A. nigrum* (Blake) with its ibeciform venter is characteristic of the *semicostatum* slabs.

The generic separation of *Eparnioceras* from *Arnioceras* is thus justified, but the time gap separating the two stocks is at present rather considerable. In the zone of *Arnioceras* sp. (beds 70f to 72) from which I recorded crushed examples with smooth inner whorls which were, with some hesitation, have yet been found on the Dorset Coast. This may be only compared to '*Arnioceras semicostatum*',⁷ no other ammonites

¹ *Loc. cit.* (1923), p. 433, text-fig. 27 (pars.).

² Spath, *Q.J.G.S.*, Vol. LXXIX. (1923), p. 70.

³ *Loc. cit.* (*Pal. Italica*, Vol. VIII.), 1902, text-figs. 56-75.

⁴ 'Über die Cephalopoden aus dem Lias der Nordöstlichen Alpen.' *Denkschr. Math.-Naturw. Kl. Kais. Akad. Wiss. Wien.*, Vol. XI. (1856), p. 25, Pl. VI., figs. 4-6.

⁵ *Loc. cit.* (*Pal. Ital.*, Vol. IX.), 1903.

⁶ Jurassic Chronology I.: Lias. *Quart. Journ. Geol. Soc.*, Vol. LXXIII., 1918, p. 315.

⁷ *Q.J.G.S.*, Vol. LXXIX. (1923), p. 70, and table to p. 84.

negative evidence, but the Yorkshire clusters with *A. semicostatum* also seem to be unaccompanied by other ammonites, and may thus well be of approximately similar age. They are therefore probably related to what has been styled the second (*bodleyi*-) wave of Arnioceratids, which includes *A. hartmanni* (Oppel), previously discussed (*Q.J.G.S.*, Vol. LXXIX., 1923, p. 69) as its latest-known member. Intermediate forms between this and *Eparnioceras*, which may have its range from the *capricornoides* to the *planicosta* zones, are unfortunately unknown, unless some of Fucini's Italian species belong to this group. Useful work, evidently, could be done on the Arnioceratids of Yorkshire, even if only derived blocks are available from the lower beds.

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Summary of Progress of the Geological Survey of Great Britain and the Museum of Practical Geology for the Year 1924. 154 pp., 11 text figures, price 2/6. H.M. Stationery Office (Adastral House, Kingsway, London, W.C.2). The work of the Geological Survey during the year 1924 was principally the revision of the maps of the neighbourhood of London and of the more important British coalfields. In this Summary a brief account is given of the general progress of the new maps of the coalfields, with particulars of the more important recent discoveries in the structure and sequence of the Carboniferous rocks. Some important deep borings for water near London are described in an appendix: one ended in Cambrian shales at a depth of 1152 feet. The Director states that the Museum is closed, and that the Kidston collection is not available to the public. Both statements are wrong.

Talks with Shepherds, by **Walter Johnson**. London: G. Routledge & Sons, 232 pp., 5/- net. We have previously had the pleasure of referring to Mr. Walter Johnson's contributions to *Archæology and Natural History*, *Folklore*, etc., and have admired his industrious methods of recording information not usually accessible to the student. In the present volume he deals with shepherds in various parts of the country. His chapter on the Lincolnshire shepherd is a particularly fascinating one, and hailing from that county, the reviewer can forgive his quotation from Cobbett that 'Everything taken together, here in Lincolnshire are more good things than man could have had the conscience to ask of God.' There are interesting illustrations of sheep, dew-ponds, a shepherd and his dog, etc. We do not recollect having previously seen so much interesting information gathered together relating to a well-known character which still keeps with us.

The Earth Before History, by **Edmond Perrier**. London: Kegan Paul, Trench, Trubner & Co., Ltd., xx. + 345 pp., 15/- net. This is one of the series of volumes on the History of Civilisation being published by this well-known firm. M. Perrier's work has been translated by Paul Radin and V. C. C. Collum, and English students will be glad to get this important work in the present readily accessible form. The first section deals with 'The Formation of the Earth,' the second part is devoted to 'The Appearance of Life'; 'The Genealogical Basis of Organic Differentiation'; 'The Genesis of the Typical Forms of the Plant Kingdom'; 'Primitive Animal Forms'; 'Altitudinal Changes and Structural Modifications'; and 'The Peopling of the Open Sea, the Ocean Depths, and the Land Masses.' The third is occupied by an account of the Life in various Geological periods, concluding by a chapter on 'The Human Form.' There is also a bibliography and index.

MYCOLOGISTS AT HACKNESS.

A. E. PECK,

Hon. Secretary, Mycological Committee, Y.N.U.

THE 324th Meeting of the Yorkshire Naturalists' Union was held at Hackness, near Scarborough, from September 12th to September 17th, and was the Annual Fungus Foray organised by the Mycological Committee.

There were present : Dr. Harold Wager, F.R.S. (Chairman), Mr. F. A. Mason, Mr. and Mrs. Greevz Fysher, Mr. S. D. Fysher, Miss G. V. P. Child (all of Leeds), Mr. J. W. H. Johnson, M.Sc. (Wakefield), Councillor E. Snelgrove, B.A. (Sheffield), Mr. John Hartshorn (Leyburn), Mr. R. Fowler Jones (Ilkley), Miss D. Hilary, B.A., and Miss M. Hewlett, M.Sc. (Bingley), Mr. W. G. Bramley (Fairburn), and Mr. A. E. Peck, Hon. Secretary (Scarborough).

Lord Derwent kindly gave permission for members to visit his charming park and woodlands. The forepart of the summer had been exceptionally dry, but for some weeks prior to the Foray much broken weather, with heavy rains, had been experienced. The woodlands, however, were found to be in very dry condition, and specimens of fungi often lay far apart.

The visitors were favoured with exceptionally fine weather except upon one day, when showers fell. The park and woodlands adjoining it were the chief collecting grounds. Small parties, however, visited Silpho Moor, Crosscliff and the wood across the Derwent behind Wrench Green.

Of *Basidiomycetes*, 169 species were recorded, 15 belonging to the genus *Lactarius*, 13 to *Russula*, and 12 to *Boletus*.

Of parasitic fungi, the agaric *Armillaria mellea* was the most prevalent, this species growing luxuriantly in many parts. Of Polypores, *Fistulina hepatica*, the well-known 'beef-steak' fungus, usually found on old oak trees, was the most common. One very fine specimen of fully 15 ins. diam. was discovered. A pair growing conveniently near the ground was photographed by three members of the party. Massee, in his 'Diseases of Cultivated Plants and Trees,' says nothing condemnatory of this fungus as a parasite, only quoting that 'Hartig considers this to be a wound-parasite.' He also writes 'Edible, but, like beef, is better for hanging for a couple of days before cooking.'

Polyporus sulphureus, which Massee quotes in the same work as perhaps the most beautiful of our Polypores, has been found upon this estate by the writer, but was not seen during the foray.

The Birch-Polypore, *Polyporus betulinus*, provided only a few specimens. This is one of the so-called razor-strop fungi. One had long heard and read of strips of this fungus being

used as razor-strops, but apparently only one of the mycologists present had ever seen one. When, therefore, it was announced by our schoolboy visitors that there were several in use in that district, a wish to inspect one was expressed. One was accordingly brought in by a boy, who stated that it was in regular use, and had been in possession of the family for over a hundred years. The writer expected to see strips of the fungus glued upon wood, and was rather surprised to find the fungus in one piece, nearly whole, in fact, with a slice cut off the edge to provide a plane surface, and with a hole, through which passed a piece of string for hanging up. The 'plane' surface used was really an undulating one. Though the exhibit was of considerable interest, it did not strike one as a very efficient medium for its delicate work. It evidently possessed the quality of durability, however.

Odd specimens of the common *Polyporous squamosus* and *P. hispidus* were brought in, as was one fine cluster of *P. frondosus*, with its numerous pileoli, and one specimen of the truly-named *P. elegans*. *Fomes annosus* occurred sparingly on roots and stumps of conifers.

In the larger parasitic fungi, therefore, the district can scarcely be described as 'rich.' Accommodation for a satisfactory classified display was lacking, but a number of visitors came in to look at the specimens, among others the Earl of Listowel, who, in return, kindly invited members to view a fine collection of his big-game hunting trophies at his residence, the "Grange."

The Village Schoolmaster, Mr. Willie Parkinson, himself a naturalist of ability, with his scholars of both sexes, also paid us a visit, and the writer described to them the more interesting specimens. Fortunately the dangerous *Amanita phalloides* and *A. mappa* were on exhibit. The edible qualities of the Puff-balls, the Beefsteak, the 'Blusher' (*Amanita rubescens*), *Lactarius deliciosus* and others were explained. The many forms, colours, perfumes, spore colour and dispersal, etc., were mentioned. Holding up a 'Horse-mushroom' (*Psalliota arvensis*), the writer asked the scholars whether this kind was eaten by the people locally, and was answered, as he suspected, unanimously in the negative. He thereupon informed them that the 'Horse-mushroom' was regarded by our members as quite a good edible, scarcely inferior to the so-called 'common' or smaller mushroom (*P. campestris*).

The two mushrooms named were only seen in very small numbers during the foray, and the only fungi served at table were the giant puffball (*Lycoperdon giganteum*) fried in slices, and the vegetable beef-steak (*Fistulina*) served ditto. Comments upon *Fistulina* were made in varied terms.

As usual, the evenings were devoted to informal addresses by members.

Mr. Johnson spoke upon 'Little Known Aquatic Fungi'; Mr. Mason upon 'The Fungi Imperfecti'; Dr. Wager upon 'The Genus *Cortinarius*'; while the writer contributed 'Recollections of Alfred Clarke,' and 'Some Funguses.' The writer's recollections of Clarke went back exactly twenty years—to the Fungus Foray held at Maltby in 1905. There Clarke agreed to name specimens sent to him, an offer of which the writer made good use, and in which Clarke did his part to the full. Without such co-operation it was unlikely that a beginner would make headway with the study. Clarke had formerly engaged himself in other branches of Natural History, but he called Mycology 'the masterpiece,' meaning that he regarded it as the most difficult of all.

In 'Some Funguses,' the writer made special reference to the 'Fly Agaric' (*Amanita muscaria*) and its use as an intoxicant by the natives of Siberia and Kamschatka. At the 'Business Meeting,' the Chairman and Hon. Secretary were re-elected; Mr. Greevz Fysher as Representative on the Executive Committee; Mr. F. A. Mason, Recorder in the place of Mr. A. Clarke, deceased; and the Committee, with the addition of Mr. John Hartshorn (Leyburn) and Miss M. Hewlett, M.Sc. (Bingley).

It was tentatively decided to hold the Foray of 1926 at Mulgrave Woods.

RECORDS.

The following are the more interesting records duly annotated as new for the Scarborough district by A. E. Peck (Local Recorder of Fungi), and F. A. Mason (County Recorder).

BASIDIOMYCETES.

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|---|---|
| † <i>Amanita porphyria</i> Fr. | <i>Volvaria gloiocephala</i> . |
| ** <i>Lepiota hispidia</i> (Lasch.) Fr. | * <i>Pluteus salicinus</i> . |
| * <i>Tricholoma cuneifolium</i> Fr. | * <i>Pholiota adiposa</i> Fr. |
| ** <i>Mycena olivaceo-marginata</i> Mass. | * <i>Inocybe geophylla</i> var. <i>lilacina</i> Fr. |
| * <i>M. parabolica</i> (A. and S.) Fr. | * <i>I. mutica</i> Fr. |
| <i>Laccaria bella</i> . | * <i>Astrosporina lanuginosa</i> (Bull.) |
| <i>Pleurotus septicus</i> . | Schroet. |
| <i>P. salignus</i> . | * <i>Cortinarius (Inoloma) argentatus</i> |
| <i>Hygrophorus turundus</i> . | (Pers.) Fr. |
| * <i>Lactarius piperatus</i> (Scop.) Fr. | † <i>C. (Hydrocybe) unimodus</i> Britz. |
| * <i>L. flexuosus</i> Fr. | <i>C. (Telamonia) armillatus</i> . |
| * <i>L. zonarius</i> (Bull.) Fr. | <i>Hypholoma Candolleianum</i> . |
| ** <i>L. hyssiginus</i> Fr. | * <i>Polyporus frondosus</i> (Fl. Dan.) |
| <i>L. picinus</i> . | Fr. |
| † <i>Russula virginea</i> Ck. and Mass. | <i>P. elegans</i> . |
| * <i>R. citrina</i> Gillet. | ** <i>Tremella foliacea</i> (Pers.) Fr. |
| <i>Nyctalis parasitica</i> . | non Bref. |

† New to Yorkshire. ** New to Yorks N.E. Division.

* New to Scarborough district.

FURTHER OBSERVATIONS ON THE NUPTIAL HABITS OF THE HERON.

EDMUND SELOUS.

LATER extracts from my diary kept in a heronry while corroborating those recently recorded in *The Naturalist* (June, 1925) go considerably beyond them.

MARCH 6TH, 1916.—Attempted coition on nest. The important point is that the bird which had, each time, before this, uttered the nuptial note, with its appropriate action of stretching up the neck and then stooping and bringing it right down in the nest, acted in this attempt, as the female, and the other as the male.

MARCH 7TH.—Coition on nest. From this point I am able to keep the two distinct, and can say with confidence that it is not the one that has just functioned as the male, but the other—the female, who, shortly afterwards, utters, with its appropriate display action, the prolonged nuptial note.

MARCH 23RD.—It is very difficult to make out the history of some of the pairs in this heronry, so that, in regard to them, I am not yet able to say decisively whether it is the male or female bird that, standing alone in the nest, signals, as it were, for a mate; or, rather, the sum total of what I have as yet seen seems to point in both directions. The logical deduction from this would, of course, be that either sex may play this part; but I must see more before I can feel certain as to this.

MARCH 26TH.—It was the bird that, though for a short time only, had played the part of 'home-bird,' clicking the bill and bowing in the nest, that in the pairing which shortly afterwards took place, functioned as the male, whereas the female was the one that flew into it. I had my glasses, and kept the two distinct from each other all the while.

APRIL 6TH.—A mated pair of birds, as it seems, have chosen a tree for the nest, of which there is, as yet, hardly a trace to be seen. Whilst one of the two arched its neck stiffly, lowered it and clicked the bill, the other stretched it up and stooping, as it reached the height, made either the 'koop' or prolonged nuptial note. (The former, as it appears to me, gradually, as the season advances, passes into or is superseded by the latter.)

APRIL 9TH.—Attempted coition on nest. Here the bird acting as the female had, just before, made the prolonged nuptial note, with genuflection and other appertaining actions.

APRIL 10TH.—Same nest as yesterday. Bird rises in nest, to receive the incoming partner. I endeavour—and I believe successfully—to keep the two distinct. The bird lately

arrived utters the 'koop' note, with appropriate action, and it is this one that, in the pairing which takes place a little while afterwards, functions as the male.

APRIL 13TH.—This time I climbed into the stunted oak tree, and sat there. In half an hour coition took place on one of the nests within my view (probably the same as in the two previous entries). The bird that played the part of the female had, a few minutes previously, uttered the prolonged nuptial note with appropriate display action. From these entries in my diary (and others which help to fill in the picture) it would seem that the display actions and notes of the Heron are common to the two sexes. The Shag is a still more interesting witness to the truth of this view, for in that species, the display, according to my notes, has been almost entirely absorbed unto herself by the female, though traces of it, or of what it once was, are still to be seen in the male. These, however, seem no longer to be purposive.

My idea, based on my own observations, is (1) That the recurrent seasonal activity of the generative system produces all sorts of more or less salient or violent actions in birds, not always confined to, though they may generally preponderate, in the male; (2) That these, at first inconsequent, have been gradually seized upon by that branch of natural selection conceived of and named 'sexual selection' by Darwin, to produce purposive courting actions, and also (3) by natural selection proper, to bring about protective resemblances and the practice and instinct of nest-building. Of the former principle the perpendicular resting attitude of the Bittern (exactly resembling one of the courting ones of the Heron) which, at least in a photograph gives it, amongst reeds, an almost reed-like appearance, seems to me a good illustration: of the latter I have adduced evidence which, though no man regards it, still seems to me strong. (4) Finally, as the flower to the stalk, Darwinian sexual selection proper (which, as I hold, my observations on the nuptial habits of the Blackcock have demonstrated) has appeared—possibly, in part, as I have suggested in *The Naturalist* for October, 1920, and, May 1921, through overcrowding in relation to contiguous nesting territories.

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It is very gratifying to find appreciative notices of the geological bibliographic work given in this journal in *The Vasculum* for October.

The Essex Naturalist, April-September, contains Sir Arthur Smith-Woodward's presidential address on 'Primitive Mammals in the London Clay of Harwich'; G. Lister describes a collection of Plants made by the late Lord Lister between 1844 and 1848, mostly from Upton; D. G. E. Erdtman gives some micro-analyses of 'Moorlog' from the Dogger Bank; there are notes on a Section at Rayleigh, Essex, showing a Transition from London Clay to Bagshot Sand, and W. E. Clegg writes on the Birds of the Stour Valley in 1924-1925.

ANTHROPOLOGY AT THE BRITISH ASSOCIATION.

SECTION H had a long and varied programme, in which all sides of the science were well represented. The President of the Section was Dr. Thomas Ashby, lately Director of the British School of Archæology at Rome. His Presidential Address was entitled 'Engineering in Ancient Rome,' a subject to which he has devoted special attention for some years past. By means of a series of excellent lantern slides and a lucid method of exposition he was able to convey to his audience a clear conception of the problems with which the Romans had to cope and which they successfully solved in the construction of roads, drains and provision for water supply in Rome and the immediate neighbourhood.

The most important item, and the one which aroused the most interest, in the proceedings of the Section was undoubtedly the Galilean skull found by Mr. Turville-Petre, in June last, in a cave near the Sea of Galilee. This was now exhibited for the first time in this country, and described by Sir Arthur Keith. An account of the circumstances of discovery was given by Mr. Turville-Petre, who described the deposits in the cave. These extend from recent times to the Bronze Age. Beneath these was a layer of fallen rock, and beneath this were deposits containing implements of Middle Palæolithic type. Associated with them was the frontal bone of the skull. Careful examination failed to reveal any possibility of the bone having been introduced into the stratum in which it was found, either by burial or otherwise. It must be concluded, therefore, that it is of the same age as the deposits. These contained animal bones, some of which have since been assigned to species still to be found in Palestine; but among them was part of a bone which has been identified as belonging to *Hippopotamus Pentlandi*. This dates the deposits as Pleistocene. The implements were stated by Miss Garrod, in a discussion which followed the reading of the paper, to be unquestionably Mousterian. Sir Arthur Keith described the fragments of the skull in detail, and pointed out the various points in which they conformed to the Neanderthal type. In certain particulars, however, Galilean man differs from the usual type of Neanderthal man, in particular in the greater height of the vault of the skull and the thinness of the bone. This latter character, however, Sir Arthur thought, was possibly due to the skull being that of a female.

The question of the antiquity of man was raised in a communication by Sir William Boyd Dawkins, who deprecated attempts to fix geological periods in terms of years, and maintained that Man disappeared from Europe during the submergence of the Atlantic border in a period which separated the prehistoric from the Pleistocene. Mr. F. S. Palmer and Mr. A. C. Hinton described the fauna of some Pleistocene gravels at Clevedon, Somerset, which were formed at about later Mousterian or Aurignacian times. Recent quarrying in limestone breccia has revealed bones of horse, bear, wolf and fox, as well as numerous small mammals. Several small pieces of chert afford doubtful evidence of man. The geological and palæontological evidence point to the deposits being contemporary with the newer deposits (Crayford and Erith) of the middle terrace of the Thames and with the older 50' Coombe Rocks of the South Coast. Miss D. A. E. Garrod discussed the Upper Palæolithic Age in Britain, and arrived at the conclusion that while the Middle and Upper Aurignacian are present in England, the typical Solutrean does not seem to have penetrated beyond East Anglia, its place being taken by a developed Font-Robert type. The Magdalenian also has a provincial aspect, a flint industry in which Upper Aurignacian survivals are very marked, being associated with objects of bone and reindeer antler of Magdalenian type. This was doubtless due to the fact that England, being situated at the North of Palæolithic Europe, was cut off during the period of severe cold in Magdalenian times. An interesting and

suggestive paper by Mr. O. G. S. Crawford dealt with climate and migration in Neolithic times in Britain, correlating the age, character and distribution of neolithic remains with a deterioration in the climate, which caused a gradual shifting of the population in these islands from west to east. Mr. T. F. Hewer described the excavation of certain barrows in the Mendips by members of the Bristol University Spelæological Society. These barrows proved to be singularly rich in flint implements, and also produced beakers and cinerary urns. M. Le Rouzic, the well-known Breton archæologist, sent a communication, which was presented, in the absence of the author, by Prof. Fleure. It dealt with the problems of the megalithic monuments of the Morbihan, Brittany, assigning them to the early age of metal. Some of the mounds, marked by small menhirs, are pre-metal; monuments built of large blocks are later. This civilization lasted down to the Iron Age and, possibly, to the coming of the Romans. Col. de Guérin described the megalithic culture of Guernsey; Mr. E. Toulmin Nicolle gave an account of the excavation of the important barrow of La Hougue Bie, Jersey, which has brought to light a passage grave in a state of complete preservation, cruciform in plan and oriented east and west. Few objects were found in the grave, as it had already been rifled, but some bones and pottery, possibly of a ritual or votive character, were obtained. The monument belongs to the transition period between the neolithic and bronze-ages. Mr. H. J. E. Peake discussed the question of the preparation of maps showing the distribution of the various classes of archæological remains, and exhibited various types of such maps. He emphasised the necessity for confining each map to a single class or, at most, to one or two related classes of objects, and called attention to the suitability for this purpose of the Ordnance Survey 'one in a million' series.

In view of the special interests of the President, and his long connection with the prosecution of Roman research in Britain, an attempt had been made to get together a series of papers representative of the work now being done on Romano-British antiquities. These filled a whole day of the programme. Recent excavations in Scotland were described by Mr. S. N. Miller, who dealt with Traprain Law, Mumrills, near Falkirk, and the terminal station on the Wall at Old Kirkpatrick, on the Clyde. He pointed out that these excavations, in addition to increasing our knowledge of the Antonine occupation in the second century, have supplied evidence of the occupation by Agricola at the end of the first century, while at Traprain we have a site affected by Roman influence long after the military occupation had come to an end. The great silver treasure which had been brought to this spot illustrated the disturbed state of Western Europe at the beginning of the fifth century in the last period of the Roman Empire. Dr. R. Mortimer Wheeler, in like manner, surveyed the results of recent excavations in Wales, and Mr. St. Clair Baddeley, in an account of the Roman villa at Chedworth, dwelt upon the desirability of considering such a unit as a Romano-British villa in relation with its surroundings and as a social organism. Sufficient work on Roman-Britain had now been done to enable us to attempt to study it by grouping together the evidence dealing with the great estates with their connecting tracks and originating centres, or cantonal towns. Mr. Ian A. Richmond described the Roman camps at Cawthorn, near Pickering, which show two periods of occupation, the first, short in time, being that of a camp of six acres, and a second, which added a $5\frac{1}{2}$ -acre camp. Though finds were few and valueless for dating within the Roman period, the type of fortification makes it legitimate to assign the earthworks to the period of Roman conquest in Yorkshire, perhaps to Cerialis or Agricola, or perhaps to both. The interesting point, however, is that this appears to be a new kind of Roman fortification bridging the gap between the tent-covered marching camps of Scotland and the siege camps crowded with temporary buildings

as at Masada (Arabia) and at Castillejo, Peña Redonda, or Renieblas (Numantia, Spain). Mr. Donald Atkinson described recent excavations at Wroxeter, and dealt with the history of Viroconium. A more intimate picture of life in Roman times was given by Mr. Heywood Sumner, who described some potters' huts which he has discovered in the New Forest. A clay floor, 15 ft. by 11 ft., bounded by six post holes, shows the plan of a hut; a raised platform may have been a sleeping place, and there was an inside fire-place, as well as an outside cooking place. On the floor of the hut were a toy pottery beaker and flagon, pottery draughts, Roman potsherds, and stone potters' tools and burnishers. A ruined pottery kiln was found near the hut. Roman coins fix the date at about the latter half of the fourth century. The ware shows a persistent imitation of Roman and Samian pottery with a fading tradition of British ornament.

Archæological researches outside Britain were represented by communications from Sir Flinders Petrie, representatives of the British School at Athens, and Mr. D. B. Harden. Sir Flinders Petrie, in dealing with the earliest civilization of Egypt, described the Badarian culture, of which evidence has been brought to light by the excavations of the British School of Archæology in Egypt. This was found beneath a settlement of prehistoric age already known at a place thirty miles south of Asyut. The pottery was finer and thinner than any in later Egypt. Glazed beads, an ivory statuette of Asiatic type, and a pottery statuette of Mediterranean type were found, together with flint work of the style found in the Fayum. An examination of the Fayum has revealed large settlements of the Badarian culture on sites, some of which are known to have been covered with water after 10,000 to 13,000 B.C. This gives the latest date to which the culture can be assigned, and accords with the age of the Solutrean in Europe, which has the same type of flint work. These conclusions of Sir Flinders Petrie and his suggested common origin for the Badarian and the Solutrean cultures, possibly somewhere in the neighbourhood of the Caucasus, the one people having retained the art of pottery making, the other having lost it, give rise to some interesting speculations. It may be noted, however, that copper would appear to have been associated with one of the burials. Mr. S. Casson described some recent excavations which he had carried out in Macedonia, and presented on behalf of Mr. Heurtley an account of excavations in the Vardar Valley in Macedonia. The mound excavated by Mr. Casson proved to be exclusively of the Bronze Age, unlike other Macedonian mounds. The earliest stratum produced objects resembling finds from the Cyclades and partly those of Helladic culture. A burnt stratum was followed by typical Macedonian Bronze Age. The upper level of the Bronze Age culture was dated by a Mycæan 'bügelkanne.' Mr. Heurtley's excavations at Vardino showed that the Bronze Age settlement was destroyed by fire and immediately followed by an Iron Age occupation. Taken in conjunction with the results, still incomplete, from another site, the excavations suggest that at the beginning of the eleventh century B.C. a large homogeneous body of invaders was on the borders of the Greek world. Mr. D. B. Harden described the recent excavations at Carthage, which have thrown much new light on Punic culture and religion.

Mr. J. Whatmough's paper on the Ligurians put forward the conclusion, based on an analysis of the remains of the language, that Liguric, linguistically as well as geographically, stands midway between Celtic and Italic, and affords a new and important link in the chain of evidence for the Italo-Keltic hypothesis.

In Physical Anthropology, Mr. P. H. Pycraft, in a communication on the number of species of the genus *homo*, maintained that it is essential that several species and sub-species should be recognised in modern man, and that the classification should be founded on cranial characters

alone. He also appealed for a reconsideration of the question of the retention of the Frankfort base-line. Mr. R. N. Salaman dealt with heredity of facial type, pointing out that in the essentially mixed Jewish community three types are to be distinguished, the Armenoid, the Semitic and the Pseudo-Nordic or Philistine type. The last-named was shown on Mendelian lines to be due, not to infusion of Nordic blood, but to the Aegean Philistine of Mediterranean race. Mr. Talbot Rice, who is a member of the Oxford Field Archæological Expedition to Kish, described the physical characters of the modern inhabitants around Hillah. They are of the type common over the North Arabic world, and belong to the Semitic members of the Mediterranean race.

In the ethnographical section of the Programme, Mr. Carline exhibited a number of lantern slides showing the various type of peasant houses in Bosnia; Miss Blackman described modern methods of pottery making in Egypt, and compared them with the methods of ancient Egypt. She was able to show that many of the modern practices can be paralleled in the methods of ancient times. Mr. E. J. Wayland exhibited an interesting series of stone tools from Uganda; and Capt. M. W. Hilton-Simpson and Mr. J. Haeseler exhibited the valuable series of cinematograph films, showing the industries and daily occupations of the Shawiya, which they have taken in the Aurès Mountains of Algeria. Capt. G. H. Pitt-Rivers' communication, 'Pagan Aua,' dealt with the little known people of an island in the Bismarck Archipelago to the north-east of New Guinea. The culture of this island is unique, and while the language is Polynesian, many of the artefacts suggest Malayan affinities. An unusual form of matrilineal matrilineity among commoners co-exists with a patrilineal chieftainship. Mr. W. D. Hambly traced the distribution of tattooing, and discussed the various reasons, ritual, magical and other, for the practice.

Prof. H. J. Rose offered a tentative explanation of the ritual combat which is said both by anthropologists and writers on Comparative Religion to be a form of sacrifice. This, however, hardly agrees with the fact that such combats often accompany fertility rites, and in intention are nothing more than sham fights. It was therefore suggested that when war *mana* was wanted an offering was made of courage or skill in arms conceived as material things, in fact, quite as material as blood or flesh.

E. N. FALLAIZE.

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YORKSHIRE NATURALISTS' UNION : BOTANICAL SECTION.

THE Annual Meeting of this section was held on October 3rd at the rooms of the Botanical Department of the Leeds University. In the afternoon the annual business of selecting officers and committees for election at the December meeting of the Union was first dealt with; when the reports of the Bryological, Botanical Survey and Galls Committees were presented by the respective convenors. Next came the General Botanical Report of the secretaries of the section, and this brought up many interesting topics. The replies to the secretaries' inquiries had been very full, and included much more than could be dealt with in the Report. Mr. Wattam's notes on seedlings, which were supplemented by others, show that the surviving seedlings of many trees at present seem to belong to the ample fruitage of 1922; this applied particularly to sycamore, ash and holly. A note by Mr. Cockerline dealt with some plants on a limestone area, which were very restricted in size by the drought. At the Coxley Valley excursion Mr. Haley drew attention to the abnormal growths of the nettles, one with an hexagonal-section stem was taken by Dr. Pearsall, but the rhizome only produced the usual square stem under

cultivation. Mr. Haley had noted many other examples of the same abnormal growth and also seen it in Figwort and Willow herb. Mr. Johnson remarked on the abundance of proliferation in the heads of *Plantago lanceolata* this year. Mr. Burnley, writing from Scarborough, had a confirmation of an old record which seemed to interest the ladies present. He stated that the orchid 'Ladies' tresses' had been re-found in the district, and he attributed the find to the craze for shingling and bobbing!

Mr. Dallmann mentioned some alien plants which had fruited this season, *Lycium chinense* Mill. (*L. barbatum* Linn) and *Erodium manescavi*. This drew attention to alien plants generally, and Mr. Cryer stated that the well-known station at Frizinghall is now very poor, whereas in 1918-19 he collected about 500 species there. In the evening Mr. Burrell showed some slides of pollens from Pennine peat under the microscopes, and drew attention to the difficulties of this study. Dr. Woodhead mentioned that he had had Dr. G. Erdtman staying with him at Huddersfield, and that he hoped to get a paper for *The Naturalist* from this Scandinavian expert. Prof. Priestley discussed peat plants from a new point of view, not antagonistic to the theory of adaptations to water shortage, but dealing with problems of plant metabolism. The chemistry of peat plants differed from that of many other plants by the accumulation of unsaturated fats as by-products, particularly in the cuticle and endodermis, which rendered them impermeable, and some remarkably interesting theories were put forward as to the mechanical control of growth by the cuticle. Fat came early and in quantity, and not only was the small size of leaves of heather and similar plants controlled by the early formation of a limiting cuticle, but the presence or absence of hairs could be traced to the same cause. The well-known intolerance of Ericaceous plants to coal gas was shown to be due to Ethylene, which delayed oxidation of fats and modified both the form of the leaf and its normal functions.

Dr. Pearsall dealt with the complex factors that influence variation in leaf shape, it being recognised that while some plants have a tendency to vary the shape of their leaves other plants have not. The tendency toward narrowed and elongated leaves in deep water is associated with weak light of short duration. A low ratio of Calcium to Potassium induces similar change, and the state is influenced in the same direction by growth conditions—summer growth with drier atmosphere, reduced pressure within the leaf tissues, reduction of sugar and increase of nitrogenous food. The broadened shortened leaf shape is associated with the alternative factors, high light of longer duration, high sugar content, increased turgidity and the high ratio of Calcium to Potassium. It was mentioned that Ivy under cultivation does not respond in the normal way to structural peculiarities.

A hearty vote of thanks was given to Prof. Priestley for his kindness in inviting the section to the rooms at the University and for his offer of the use of these rooms for an indoor meeting of the Union during the winter.—CHRIS. A. CHEETHAM.

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Birds of an Indian Village, by Douglas Dewar. Illustrated by G. A. Levett-Yeats. London: Humphrey Milford, Oxford University Press. 146 pp., 6/- net. Previous to the first edition of this volume, the author tells us that its chapters originally appeared in the *United Provinces War Journal*, and that the birds described are found in 'every village of the plains of India.' We also learn that 'it is the first book of the kind written for Indian readers.' That it has been successful seems to be indicated by the fact that a second edition has been called for, which is illustrated by a large number of black and white sketches of varying merit.

FIELD NOTES.

ARCHÆOLOGY.

Another Bronze-Age Beaker at South Cave.—Further excavations at South Cave, in the immediate vicinity of the locality where the Bronze-Age beaker was found (see *The Naturalist*, September, page 272), have resulted in a second beaker being discovered; but, as in the previous case, it is in innumerable small fragments, and so incomplete as to be impossible to restore it. Generally speaking, it is of a similar type, in decoration, to that already referred to, but, if anything, its surface is more thickly covered by herring-bone and other designs, made by finger-nails.—T. SHEPPARD.

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VERTEBRATE ZOOLOGY.

Vertebrate Zoology Notes from Shropshire.—The Dormouse, which used to be quite plentiful about here, has got less and less in numbers, until now it seems to have vanished. I have not seen one, or any sign of a nest, for three or four years. The Squirrel, on the contrary, shows a marked increase, and after a period of scarcity is quite common again. The Barn Owl, of which we used to have many individuals, has dwindled sadly, dying off for no apparent reason. The last one I knew of was found dead a week ago. It had no injury and was in fair condition. This bird, which was easily recognisable, because it had lost an eye, had inhabited a certain loft for about two years. The Great Spotted Woodpecker, which we used to look upon as a rarity, has become very common, more so than the Green Woodpecker.—FRANCES PITT, Bridgnorth.

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MOLLUSCA.

Mollusca at Hackness.—On the recent Fungus Foray at Hackness, some attention was given to the local Mollusca. Lord Derwent protects and encourages water fowl, which visit all the stagnant waters in great numbers, and it is probably on this account that the waters are almost devoid of molluscan forms. Mr. Gyngell, of Scarborough, informs me that an unusual variety of *Anodonta cygnea* can be obtained from a pond near Langdale End, by wading; but in the case of this pond, as well as others, prolonged and careful dredging yielded no mollusca whatever. The fishing clubs make large purchases of *Limnæa peregra* as food for fish in the River Derwent, and in the case of Cross Cliff Fish Pond, the occupier of the land is believed to have obtained a large quantity of the same species for his lake, and in this case again not a mollusc could be obtained from a sheet of water which looked

very promising, being well furnished with plants which usually harbour both univalves and bivalves. Much rain fell during the Foray, and many species of land snails were taken. The following is a list of those determined by Mr. John W. Taylor, M.Sc. :—*Arion ater*, juv., *A. circumscriptus*, *Agriolimax agrestis*, *Limax maximus*, *Vittrina pellucida*, *Hyalinia cellaria*, *H. crystallina*, *Conulus fulvus*, *Pyramidula rotundata*, *Helix aspersa*, *H. hortensis* v. *lutea* 12345 and 00000 common, 10305, 00305 and 12045 rare, *Helicigona arbustorum*, *Hygromia striolata* and var. *rubens* and *alba*, *H. hispida* var. *alba*, *Ena obscura*, *Clausilia bidentata*, *C. laminata*, *Limnaea peregra*, *Ancylus fluviatilis*, *Pisidium subtruncatum*.—GREEVZ FYSHER.

A New Locality for *Vertigo moulinsiana* (Dupuy) in Denmark.—In April last I examined the Ordrup Mose (Moor) near Copenhagen, and found very commonly on *Phragmites*, *Juncus*, etc., a number of *Vertigo moulinsiana* Dupuy. This species has its recent northern, and isolated, limit in Denmark, and consequently occurs very sporadically. It is recorded from different localities round the Furesö, Lyngbysö and the Mölleaa, north of Copenhagen, but several of the localities are destroyed ; in all cases this is the fact with the locality Lersöen, near Copenhagen. Further, Lindenberg, near Roskilde ; Ulsesö, between Haslev and Faxe, in South-east Zealand (Schlesch, leg.) ; and Treskohage, at Vejle fjord, in South-east Jutland. Sub-fossil, it is not known from Denmark, but from Sweden, where it does not occur recent, it is recorded from the Pleistocene of Rangilstorp, in Östergötland.—HANS SCHLESCH.

On the occurrence of *Xerophila intersecta* Poiret (= *X. caperata* Mont.) in Denmark and Schleswig.—In Denmark, *Xerophila intersecta* Poir. was first observed by Herm. Lyngé in 1896 at Faxe limestone quarry in South-east Zealand, and later is recorded from Möens Klint (Isle of Möen) ; Christiansminde, nr. Svendborg, and nr. the lime-kiln at Lundeberg, in South-east Funen ; and now my colleague, Holger E. Pyndt, sends a number of specimens collected September 20th, 1925, at the lime-kiln at Hasselö, near Nyköbing (Isle of Falster), where it occurs commonly. In Schleswig it was observed in 1872 by Ernst Friedel on the fortress of Dybböl, and in 1884 by Wüstnei in the neighbourhood of Sönderborg (Isle of Als) ; further, near Broager, by Wohlstadt, 1914 ; above the old lime-kiln at Ballastberg, nr. Flensburg, by Hans Philippsen ; and at the Kjökkenmöddings at Windebyer Noor, nr. Eckernförde, by E. Wüst and O. Schuster, 1919. In Holstein it occurs at several places near Plön and Eutin, and near Lübeck. In the Scandinavian peninsula *Xerophila intersecta* Poir. is not yet recorded. It seems remarkable, however, that the sudden and sporadic occurrence of a English-French species, and in

several cases near lime-kilns, that one may suppose that the distribution is caused during transport by limestone (from Faxe?).—HANS SCHLESCH.

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BIRDS.

Little Owl nesting in Wharfedale.—A pair of Little Owls has this year successfully reared a brood of young on the banks of the Wharfe between Harewood and Pool.—R. FORTUNE.

Little Auk at Harden, W. Yorks.—A person from Harden has just brought me a live Little Auk, which had been caught on Cullingworth Moor last Thursday. Two or three other specimens have been caught not far from here within the last fifty years, the last being picked up on the highway near the Allerton tramway terminus about ten years ago. It refused all such food as I should have thought would have been suitable.—E. P. BUTTERFIELD, Wilsden, 17th October, 1925.

Tawny Owl in Harrogate.—The Tawny Owl has become exceedingly common in and around Harrogate, and I am constantly asked to identify birds which have disturbed the rest of people subject to insomnia. This year a pair had a nest behind some ivy upon a window-ledge of a house in the town, and successfully reared their young there. Only a few nights ago, a friend, driving his car in the night time, was startled by something dashing into his wind screen. It proved to be a fine Tawny Owl, which paid for his carelessness with his life. Mysterious noises in a bedroom in a friend's house, occupied by a niece, caused the alarmed lady to abandon it; the noises occurred again on the following night, and were located as coming from the chimney. The cowl above the fire-place was removed, when, accompanied by a cloud of soot, out popped a very black Tawny Owl, who caused some trouble before he was evicted through the open window. A few mornings after the same lady, when awakening from her slumbers, was again startled when she saw another Tawny perched on the rail at the bottom of her bed. The rookery which existed for a number of years in the Church Wood, situated between Cold Bath Road and Beech Grove, was, after declining in population for some years, eventually abandoned through several Tawnys appropriating the nests of the rooks in which to rear their own families.—R. FORTUNE.

The Wharfedale Canadian Geese.—I saw to-day, 15th October, 1925, a portion of a bag of four Canadian Geese, which had been shot near Boston Spa. They were feeding in a large flock, upon a stubble, but they had not the wariness of the wild geese of the wolds, and allowed themselves to be driven over to the gunners. They were fine birds, and weighed

almost exactly $11\frac{1}{2}$ lbs. each. There is a very large flock of these birds in this district, over which they fly continually, from Harewood to Ripley, to Fewston, to Gouthwaite, to Fairburn, and other places. I am continually coming across them in my wanderings, and several times they have passed right over my house, just skimming over the top, calling loudly as they fly. People are constantly reporting to me that they have seen a flock of wild geese flying over, and foretelling bad weather as a consequence, little dreaming that they are a local flock. They are perfectly wild, owning no one as master, and wander freely over a wide area, but making their headquarters at Harewood, finding peace and security on the lake there. This lake is a sanctuary for all wild fowl, as Lord Harewood does not allow a shot to be fired in its neighbourhood. The farmers in the district take toll of them occasionally, for, in addition to the four mentioned, five were shot at Ripton a day or two ago. One farmer secured a fine gander weighing nearly 17 lbs., and anticipated a feast, but, alas, when cooked he was so tough that it was impossible to dismember him.—R. FORTUNE.

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ENTOMOLOGY.

Newsteadia floccosa in Derbyshire.—A single specimen of the female of the scale insect, *Newsteadia floccosa* (De G.), one of the *Ortheziinae*, was taken on the mycelium of a fungus growing on the inner side of a piece of loose bark, at Cordwell, Derbyshire. The white silky plates covering the body harmonised so perfectly with the fungus, that it was very difficult to detect the insect. It seems to occur most usually among moss, dead leaves and plant debris (Newstead, 'Monograph,' Vol. II., p. 245). I do not know that it has been previously recorded for Derbyshire, though common in some places.—JAMES M. BROWN, Sheffield.

Wasps at the Figwort.—It is well known that wasps, especially *V. sylvestris*, have a partiality for the flowers of the figwort, the length of their tongues enabling them to reach the nectar collecting at the base of the corolla. The large number of insects, including wasps, bees and Syrphids, flying about the blossoms of *Scrophularia aquatica*, *Epilobium hirsutum*, *Eupatorium*, *Angelica*, *Senecio* and *Cirsium palustre*, growing at the foot of the cliffs at Sandsend, attracted my attention in August last. Among this wealth of bloom, the wasps invariably selected the figwort, neglecting the more conspicuous associated plants; while the bees and Syrphids attended to these latter and neglected the figworts. Kerner (Vol. II., p. 197) states that brown flowers are attractive to

wasps. (They were plentiful on ivy blossoms in September.) On two occasions wasps were captured on the *Scrophularia*, with the following results :—*V. vulgaris*, 9 ; *V. germanica*, 1 ; *V. rufa*, 11 ; *V. sylvestris*, 8 ; *V. austriaca*, 0 ; *V. norvegica*, 1. These numbers, naturally, give only very roughly the relative abundance of the different species, as *rufo*, for example, seemed to elude capture less readily than some of the other species.—JAMES M. BROWN, Sheffield.

Immigration of White Butterflies in the Wilsden District.—The most remarkable feature in insect life this year in this district has been the occurrence of immense swarms of white butterflies, large and small cabbage, especially the former. Probably more large cabbage butterflies were seen in this district (Wilsden) last summer than for the last twenty years. On the 13th August there were thousands of white butterflies flying over and about some corn fields near Thornton ; and on the 22nd Aug., near Rycroft, Keighley, white butterflies were so numerous that they gave one the impression that it was 'raining' butterflies. This immigration was not confined to this district, nor even to England, for I saw in one of the newspapers that information from Italy stated that 'yesterday, 28th August, at Verona and Mantua, there were clouds of white butterflies, which entered hotels, cafés and other places, to such an extent, that business was at a standstill for two hours.' Nothing had ever been seen like it before. They remained for at least four hours, and then departed.' While white butterflies have been so abundant in this neighbourhood this year, coloured butterflies have been extremely rare.—E. P. BUTTERFIELD, Wilsden, Bingley, October 12th, 1925.

The 'White' butterflies seem to have been exceptionally abundant everywhere this year ; and the Vanessids equally scarce in both the North and South of England.—G.T.P.

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BOTANY.

Tees-side Plants (ante p. 315) Correction.—In *The Naturalist* for March, 1906, p. 92, the late P. Fox Lee, of Dewsbury, recorded the occurrence of *Erythraea pulchella* Fr. as growing in Mr. Lofthouse's locality, and noted it as an addition to the flora of the North Riding. I myself also saw the plant there in 1909.—WM. FALCONER, Waterloo, Liverpool, 20th October, 1925.

***Centaureum capitatum* in North-east Yorkshire : A new County Record.**—Students of the flora of the North of England will be interested to learn that *Centaureum capitatum* Willd. has been found growing under perfectly wild con-

conditions, and in some quantity in the Whitby district this season. The plant was named by Mr. R. J. Flintoff, of Goathland, and by him submitted to botanical authorities, by whom his identification has been confirmed. Dr. Druce and Mr. J. Fraser Robinson are of opinion that this is a new record for Yorkshire. Dr. Rendle has asked that a specimen of the plant may be sent to him for the British Herbarium.—F. SNOWDON.

The 'Tree Balsam' in the Ryburn Valley, Yorks.—This striking member of the balsam family, *Impatiens glandulifera* Royle, is one of many desirable hardy plants native of India, where the Balsam tribe are very numerous. Its flowers are so numerous from the axils of the upper leaves that they form a large leafy panicle. There is a wild beauty about the plant; its coarse, dark green foliage, remarkable quaint-looking zygomorphic flowers, and their peculiar tone of colour causes them to stand out very conspicuously during dull weather. In common with many of its allies, the flowering season extends over a lengthened period. The flowers are in greatest perfection in autumn; excess of moisture seems to be favourable to these plants, and for many years now the species has flourished in damp and shady spots under the moist rocks below the Pitcher Pit in Lumb Clough, closely associated with other moisture-loving plants, and enshrouded by the foliage of tall beech and sycamore trees. The introduction of this plant from the North of India is due to the liberality of Dr. Forbes Royle. It appears to have been first recorded as an alien in England in 1855, when it was found in Middlesex. For over thirty years now it has been freely established and increased very rapidly on both banks of the Calder about Sowerby Bridge.—JOE FIRTH.

***Inula Helenium* Linn. in North-east Yorkshire.**—On the 17th September, 1925, I pointed out to Mr. J. Fraser Robinson, of Hull, an extensive growth of *Inula Helenium* Linn., in flower, in a certain locality in North-east Yorkshire, and I have been told by a farmer, who lives close to the place where it grows, that he has known the plant for fifty years in this station. A few days ago, on looking through a book published in 1836, dealing to some extent with the history of the district, and containing a list of many plants recorded by a doctor residing thereabouts, I find *Inula Helenium* mentioned as growing in the same place where it is found to-day, and this is eighty-nine years ago. How long before this date the plant flourished in its present station I am unable to learn, but it is probable the *Inula* has been established here for more than a century.—R. J. FLINTOFF, Goathland, 23rd October, 1925.

FISHES.

Rare Rays at Scarborough.—On August 31st, while examining the contents of one of the rubbish barrels upon the local fish market, I found therein a small ray about 16 inches in total length which I recognised as the Starry Ray (*Raja radiata*). I took it home and thoroughly examined it, and have no doubt as to its identity. In 'The Vertebrate Fauna of Yorkshire' this species is mentioned as one of the rarest of the Yorkshire Rajidae, but no details are given of its occurrences. I have several times previously seen this species amongst the heaps of small rays on the fish market, but it is often—indeed usually—impossible to get hold of the specimens. The fisherman do not know it; and one of them to whom I showed my find assured me it was a young Thornback. On September 18th a fisherman named Ned Eve, trawling in the South Bay, close inshore, in his motor boat 'Wave,' captured a small example of the Sting Ray (*Trygon pastinaca*). It measured about 14 inches in length. Unfortunately, the specimen was thrown away, and I did not get it, but I satisfied myself that the identification was correct. This is the first time I have known the Sting Ray in our Yorkshire waters, although 'The Vertebrate Fauna of Yorkshire' gives it as resident. None of the fishermen who saw it knows of another one having been taken in the past.—W. J. CLARKE.

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REVIEWS AND BOOK NOTICES.

Fifty Years of Sport, by E. D. Miller. London: Hurst & Blackett, Ltd., 350 pp., 21/-. We learn from the title page that the author of this book is C.B.E., D.S.O., D.L., J.P., President of the National Pony Society, 1923, President County Polo Association, 1923-1924, Chairman of the Rugby Division of Warwickshire Conservative and Unionist Association, 1923-1924; and there are twenty-four illustrations representing his interest in sport at home and abroad. As a great Polo enthusiast he is naturally interested in horsemanship, which takes a prominent part in his reminiscences. He begins his story with an account of Hertfordshire and Private School, Cambridge and Harrow. He then takes us to India, Egypt, South Africa, America, Spain, East Africa, and, in between, back again to England and Polo and fox hunting. The volume is a record of reminiscences of a strenuous life, and a photograph of the author appears as frontispiece.

Some Other Bees, Butterflies and Moths, by H. Mace. London: Hutchinson & Co. 160 pp., 4/6. In this volume the author gathers together a number of articles which have appeared in *Science Progress*, *The Nineteenth Century and After*, etc. He deals firstly with various forms of bees (carpenter, mason, leaf-cutting, etc.) and then follows with 'The Idiosyncrasies of Butterflies'; 'Fritillaries'; 'The Butterfly as Traveller'; 'The Wonderful Hawk Moths'; and 'The Evolution of the Caterpillar.' There are several striking illustrations, and the chapters are well written. The paper seems unnecessarily thick, but, we presume, otherwise the 160 pages would not make the volume bulky enough to appear to be worth 4/6.

The Pocket Book of British Birds, by **R. Kearton** and **Howard Bentham**. Cassell & Co., ix.+389 pp., 6/- net. By the aid of thin paper and small but quite clear type Mr. Kearton and his son-in-law have written a popular account of British Birds which is literally a 'pocket' book, measuring only 4 ins. \times 6 $\frac{1}{4}$ ins. \times $\frac{3}{4}$ in. About 1 $\frac{1}{2}$ pages are devoted to each species—dealt with under the heads of Description, Distribution, Habits, Food, Nest, Eggs, Notes. There are also close upon two hundreds illustrations, principally from photographs by the brothers Kearton, and Mr. John Kearton, the son of one of the authors. A compact and serviceable little book.

Letters from W. H. Hudson to Edward Garnett. London: J. M. Dent & Sons, Ltd., xiv.+218 pp., 6/- net. Recently the letters from Hudson to Mr. Morley Roberts were published, and now we have the correspondence between Hudson and Mr. E. Garnett. There is, of course, much of general interest in the correspondence, but whether printing such details as 'I think of staying here about a week longer and then back to London' or 'with love to all' or 'I hope Mrs. Garnett is well' or 'I hope Constance and David are well' are really worthy the space these words occupy is a matter presumably for the editor and publisher. Just now Hudson is evidently a 'god-send' to the publishers, but isn't it being a little bit overdone?

A Book about Birds, by **E. L. Turner** and **R. Gurney**. London: C. A. Pearson, Ltd., 120 pp. 'Books about birds' are as common as blackberries just now, but in view of the reputations of the two authors in this case the present volume will probably have a good sale, especially as it is an 'Introduction to the Study of their Structure, Habits and Characteristics for Scouts, Guides and others.' There are sketches and photographs by the authors, and chapters on Courtship and Song, Folklore, Hints on Identification, Protection, etc. The paper is unnecessarily thick, but otherwise, perhaps, the volume would hardly appear to be worth 3/6.

Bees, Wasps and Ants, by **C. A. Hall**. London: A. & C. Black, viii.+88 pp., 2/6 net. This is an attempt to popularise the study of these insects, and the publishers, by the beauty of the four coloured plates, attractive cover, and in other ways, have certainly produced a book for which half-a-crown does not seem exorbitant. Here again, however, the unnecessarily thick paper bulks the book. Although it contains considerably fewer pages than three parts of *The Naturalist*, the book is as thick as our annual volume.

Bird-Song: A Manual for Field Naturalists on the Songs and Notes of some British Birds, by **Stanley Morris**. London: H. F. and G. Wetherby, iv.+134 pp., 6/- net. Lord Tavistock tells us he has read this book, and there is much in it of scientific value. The author tells us that there is no county in with the song of birds can be studied to better advantage than perhaps Sussex. Certainly Sussex a few years ago produced a wonderful crop of 'new British Birds seen in the flesh,' but we were able to show that some of these had been given a locality and a name by the dealer with the object of getting more for the specimens than if he had honestly stated he had imported them. There are lists of birds which sing at night-time, on the wing, on the ground, and birds which, sing in concert.' At Worthing, in 1916, the author heard 'a young bird which had not yet assumed the full adult plumage rehearsing all the song notes.' We know that bird!

Laboratory Directions in General Zoology, by **W. C. Curtis** and **Mary J. Guthrie**, Professors of Zoology in the University of Missouri. London: Chapman & Hall, xxxiii.+194 pp., 7/6 net. This is essentially a book for the zoological student. It refers to the Frog, Use of the Microscope, Histology, Amœba, Euglena, Paramœcium, Gregarina and Monocysts, Other Protozoa, Yeast and Bacteria, and so on to material

for the Study of Variation, Heredity in Drosophila. The work contains no waste of words : it is essentially a students' handbook, but we think it worthy of a cloth cover.

The Land and Its People. Chapters in Rural Life and History, by the Right Hon Lord Ernle, M.V.O., formerly Fellow of All Souls' College and Honorary Fellow of Balliol College, Oxford ; late President of the Board of Agriculture, 1916-1919. London : Hutchinson & Co., 257 pp., 10/6 net. The Chapters comprising this work originally appeared in *The Quarterly Review* ; *The Nineteenth Century* ; *The Journals of the Ministry of Agriculture* and of the *Royal Agricultural Society* ; or *Hunter's Seed Catalogue*, but they have been revised and brought up to date. They deal with the Village Farm, Enclosure of Village Farms, Obstacles to Progress, Agricultural Workers in 1800 and 1925, County Villages, the Food Campaign, 1916-18, Women on the Land, 1917-19, Fallacies about Landlords, Farmers in Politics, and the Future of Agriculture.

Sea-wake and Jungle Trail, by H. Warington Smyth, C.M.G., M.A., LL.M., F.G.S., F.R.G.S., M.I.M.M. Late Lieutenant R.N.V.R., illustrations by the author and F. H. Sibson (Lieut., R.N.V.R. (S.A.)). London : John Murray, xvii.+323 pp., 16/- net. This is a very amusing narrative of a journey to the east among elephants and whales. He deals with the Little Elephant, a Monsoon Squall, the Rajah and the Prior, the Whale and the 'Meercat,' a Way of Life, etc. The story is most fascinating, and written by one who sees the funny side of things.

Early English Ornament. The Sources, Development and Relation to Foreign Styles of Pre-Norman Ornamental Art in England, by J. Brondsted, with a Preface by R. A. Smith, translated by A. F. Major. London : Hachette, 18 King William St., Charing Cross, 352 pp., price 21/. In his brief Preface, Mr. Smith tells us that 'The old question whether the animal ornament distinctive of Northern Europe was a mere adaptation of classical or provincial Roman motives, or whether those grotesque forms were an independent Teutonic invention, has been cleared up by new evidence from the East, and the interest has now shifted to the late centuries, when Christianity had transformed the West of Europe, and Viking Expeditions were widening the outlook of the North. . . . How Denmark helped to make English history a familiar story ; but the early interchanges of artistic principles between the two countries has only been established in recent years, and to Dr. Brondsted is due much of the credit for this notable advance in Viking archæology.' The volume is particularly well illustrated, and, by the various blocks, demonstrates the influence of the vine leaf motif in early Danish decoration.

Dunstable Library and Museum Publications. No. 1—An Early Iron Age Spear found near Dunstable and Notes on the Early Iron Age, by T. W. Bagshawe, F.G.S., F.Z.S., F.R.G.S. (Hon. Curator). 7 pp., price 3d. On August 23rd an iron spear head was presented to the Dunstable Museum, having been thrown out by a workman digging a trench. Mr. R. A. Smith, of the British Museum, reported that 'Your spear-head must belong to the earliest Iron Age, as it is a copy in iron of a late Bronze-Age type.' The author then tells us that the Eolithic age was previous to the Palæolithic age, beginning about 50,000 B.C., Neolithic age about 5,000 B.C., Bronze age about 2,000 B.C., Early Iron age about 1,000-800 B.C. (ending with Roman Invasion) and so on. There is an illustration of the spear head, but 3d. seems a lot for seven pages.

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The Vasculum for October contains J. A. Smythe's Observations on a Burning Pit-heap ; J. W. H. Harrison describes Late September on Woldridge Fell ; M. R. Hull describes Excavations on the Roman Wall ; and there are several notes on natural history records.

NEWS FROM THE MAGAZINES.

Dr. F. A. Bather writes on 'Dinosaur Eggs' in *Nature*, No. 2916.

J. S. Huxley writes on 'The Courtship of the Oystercatcher,' in *The Ibis* for October.

J. Brontë Gatenby and Marie C. Stopes write on 'Spermatogenesis of Spiders' in *Nature*, No. 2918.

W. G. Sheldon refers to 'The Early Stages of *Eriopsela quadrana*' in *The Entomologist* for October.

W. Bowater describes and figures a new Hybrid, *Furcula-Bicuspis*, in *The Entomologist's Record* for October.

W. P. Pycraft contributes 'Diagnoses of Four Species and one Sub-species of the Genus *Homo*' to *Man* for October.

The Amateur Aquarist for 'Autumn' deals with Rock Pools at Home, The Eel, Chameleon Fly, The Bully, Phantom Larva, Freshwater Lamellibranchs, etc.

An excellent and well-illustrated account of 'The Cave Dwellers of Creswell Crags: A Record of Recent Excavations,' by A. L. Armstrong, appears in *Discovery* for October.

The Journal of the Imperial Fisheries Institute, Tokyo, for August, contains, among other papers, 'Optimum water temperature for hatching the eggs of *Hypomesus olidus* Pallas,' 'The Relation between Temperature and the Rate of Development of Fish-eggs,' and 'The Culture of *Gracilaria confervoides*.'

Among many interesting notes in *British Birds* for October are 'Some Ecological Aspects of British Ornithology,' 'A Study of the Robin by Means of Marked Birds,' 'Nesting of the Great Spotted Woodpecker,' 'Woodlark Nesting in North Lincolnshire,' and 'Black-tailed Godwit in Cumberland.'

In *The Entomologist's Monthly Magazine* for October, Mr. Norman H. Joy describes '*Atheta subdebilis*: A Coleoptera New to Science,' and F. W. Edwards describes 'Two New British Sciarinæ (Diptera).' Mr. G. T. Porritt refers to the extraordinary abundance of *Orgyia antiqua* near Huddersfield.

The Advancement of Science for 1925 contains the Presidential Address to the British Association of Prof. H. Lamb, and the thirteen Sectional Presidential Addresses, delivered at Southampton. They are in a neat cover and sold at 6/- at the Association's Offices, Burlington House, Piccadilly, London.

The Journal of the Ministry of Agriculture becomes more and more interesting as time goes on, the October number containing 'State Assistance for Winter Land Drainage Works'; 'System in Making Hedges,' by G. H. Hollingworth; and 'Some Recent Weeds in the South-western Counties,' by E. W. Fenton; among many other useful notes.

Since *The Irish Naturalist* ceased to be, the necessity for a journal of natural history for Ireland has been felt. Under the auspices of the Belfast Naturalists' Field Club *The Irish Naturalists' Journal* has appeared, and will appear six times a year. The editor is J. A. S. Standall, who is supported by a strong staff of fifteen helpers in different departments. The first part of the new Journal contains notes on bees, birds, classification of plants, buttercups, mosses, geology, surnames and shell necklaces. The price of Part I., for September, is 1/3.

The Eastbourne Natural History, Photographic and Literary Society has discontinued its quarterly journal and reverted to its former method of publishing occasional *Transactions*, and before us is the first part of Volume IX. It is a useful publication, and has a number of valuable contributions to the natural history of the area of the Society's activities, including 'Parallel Variation in British Lepidoptera,' by Robert Adkin; 'The Wild Roses of Eastbourne,' by T. J. Richards; 'List of Local Coleoptera,' by Karl Wilkinson; and 'Palæoliths and Pre-Palæoliths,' by Harry Morris.

NORTHERN NEWS.

On October 25th, the Leeds Museum was opened on a Sunday afternoon for the first time.

The Chester Society of Natural Science, Literature and Art has issued its Fifty-fourth Annual Report and Proceedings, which include a record of the work of the various sections, a list of the members, etc.

Mr. Guy Maynard sends us the 'Seventy-sixth Report of the Museum and Art Gallery Committee of Ipswich.' It has a good list of additions, and useful illustrations of the rooms in the well-known Christchurch Mansion.

A Yorkshire Museum has recently received some cases containing a large number of land and freshwater mollusca, and the description of these given by the shipping clerk on the Continent is 'Packages of Snail-houses in glasses.'

Mr. A. G. Wright sends us the *Report of the Colchester Museum* for the year ended March, 1925 (32 pp., 6d.), which contains illustrations of a remarkable series of late Bronze-Age pottery, and an excellent record of additions to the museum for the year.

'A.M.Y.' in *The Observer*, Sunday, October 25th, has a column headed 'Can Fish Smell.' We can assure him (or her) that they can! The same journal states, under the head of 'Lost Villages,' that 200 have gone 'from Lincolnshire alone.' We don't believe it.

Messrs. Wheldon and Wesley have issued a particularly useful catalogue of works dealing with the Invertebrata, which includes particulars of about four thousand different pamphlets and other publications, all carefully classified under headings for handy reference.

As publication No. 14, the London County Council has issued 'A Handbook to the Cases illustrating simple means of Travel and Transport by Land and Water' in the Horniman Museum, Forest Hill (71 pp., 6d.). The handbook has been written by Dr. H. S. Harrison, and is therefore excellent.

The Summary of Progress of the Geological Survey for 1924—a progress made possible by men with big pipes and big hammers and hob-nailed boots, begins in large type with 'May it please your Lordships.' We will guarantee that none of them cares whether it pleases their Lordships, or does not!

Under the heading of 'Fossil Find,' illustrations of a Nautilus appear in the press recently, with the following information:—'Two views of a fossil nautilus shell found during excavations for the foundations of the "Daily News" and "Star" new buildings in Bouverie Street, E.C. The age of the London clay in which it was imbedded is generally estimated at 500,000 years, and the size of the shell is about 6½ inches by 4½ inches.'

We have received from H.M. Stationery Office the 'Report of the Second Imperial Entomological Conference, June, 1925,' (35 pp., 9d.). All we can say is that it is very satisfactory that reports of conferences of this character can be issued by H.M. Government, and at so reasonable a rate. From the same source we have received a 'Return showing the number of Experiments on Living Animals during 1924 under Licences granted . . . ' (59 pp., 1/-).

The British Museum (Natural History) is issuing a wonderful series of postcards illustrating the different specimens in its collections, with descriptive letterpress. There are two series illustrating British birds in colours; others illustrate foreign mammals and birds, British flowering plants, and various sets of coloured representations of Precious Stones. Each set is in a substantial envelope, and sold at 1/-. The illustrations of the precious stones are by far the best, that of opals being particularly fine.

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The Manchester Guardian says:—"This is a readable, popular history from the New Stone Age to the fifteenth century, with chapters on the feudal system, on the numerous monasteries in the district, and on the daily life of monk and layman in the Middle Ages. In the period to which it relates the Riding was the scene of many foreign invasions and of much civil war, and the author's object has been to show the relation of the local history to that of the nation. The volume contains many illustrations, and the price is astonishingly low for so handsome a work."

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A MONTHLY ILLUSTRATED JOURNAL
PRINCIPALLY FOR THE NORTH OF ENGLAND.

EDITED BY
T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums Hull;

and **T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,**
Technical College, Huddersfield,

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
G. T. PORRITT, F.L.S., F.E.S.

JOHN W. TAYLOR, M.Sc.

RILEY FORTUNE, F.Z.S.

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Ingham Collection of Mosses ; Rare Examples ; Beach Material and
Coast Erosion ; British Mosquitoes and their Control ; Evolution ;
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NORTH OF ENGLAND HARPIDIA, by J. A. Wheldon (28 pages, four plates, and illustrations in the text), occurs in *The Naturalist* volume for 1902, a few copies of which are left, price 5/-

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NOTES AND COMMENTS.

FISH STORIES.*

Those fond of 'fish stories' will find their keenest appetites satisfied with this book. Fortunately the photographs are apparently 'untouched,' otherwise we certainly should have doubted the number of the extraordinary captures described therein. The author seems to have specialised in fishing in waters in various parts of the world, where the larger species abound, and certainly he has been successful. That accounts of piscatorial adventures are in demand, and that these records



Sawfish, 31 ft. long, weighing 5,700 lb.

are written in a racy and reliable manner, is shown by the fact that a third edition of the work has been called for. The frontispiece consists of a photograph of 'the author and his native fisherman on a Coral Reef in the Caribbean,' but nothing is given to indicate 'which is which,' though we assume the author is the man with the pipe!

BRITISH BIRDS.†

We are able to announce that on October 15th, Messrs. Longmans, Green & Co., issued Volume II. of this wonderful

* 'Battles with Giant Fish,' by F. A. Mitchell Hedges. London: Duckworth & Co. 307 pp., 10/6 net.

† By Archibald Thorburn. London: Longmans, Green & Co. ix.+130 pp., 16/- net.

publication. It is not simply a new edition, as the former work under the same title contained 82 plates, whereas this issue, in four volumes, contains no fewer than 192 plates, in colours, all from new drawings specially made by Mr. Thorburn, the different size of the present issue necessitating this. Members of the Order Passeres, from the Starling and the Chough (in our opinion one of the most successful plates in the volume) to the Shore-lark; Order Picariæ, from the Swift to the Cuckoo; Order Striges, from the Barn Owl to the Eagle Owl; Order Accipitres, from the Marsh Harrier to the Osprey; Order Steganopodes, from the Common Cormorant to the Gannet; Order Herodiones, from the Common Heron to the Common Bittern; are ably figured and described. In addition, sixteen closely related forms are described, but not figured.

INGHAM COLLECTION OF MOSSES.

The late William Ingham's collection of British Mosses and Liverworts has, by gift, found a permanent home in the University of Leeds. It contains twelve thousand specimens, including gatherings by many well-known bryologists, such as the late Professor T. Barker, R. Barnes, Dr. R. Braithwaite, Boswell, J. Needham, J. Nowell, Dr. H. F. Parsons, W. H. Pearson, M. B. Slater, Dr. R. Spruce, Wm. West, J. A. Wheldon and Wm. Wilson. There is a large series of Harpidioid Hypna vouched by H. N. Dixon, Wheldon and Renauld that will be valuable for the study of that polymorphic group. A comprehensive collection of Sphagna tested by Wheldon will supply types of the varieties and forms described in his synopsis of the European Sphagna.

RARE EXAMPLES.

Among plants having a sentimental value may be named the first British gatherings of *Tortula cernua* at Aberford and Conisborough; the first Yorkshire gathering of *Jubula Hutchinsiae* at Hebden Bridge; *Thuidium Blandovii* gathered by Barnes at Halnaby, probably now lost to the county by drainage of the Carrs. The known history of *Tetraplodon Wormskjoldii* in the country is illustrated by a number of gatherings, including Slater's plant (1870) which remained unrecognised until Jones and Horrell refound it in the same district in 1901. Many vouchers for new county records were sent to Ingham as compiler of the Census Catalogues of British Mosses and Hepatics; it is to be hoped that these will attract similar material in the future. Leeds is a convenient centre. Mr. W. H. Burrell, F.L.S., who has already expended time and skill in the arrangement of the specimens, has been appointed Honorary Curator of the Collection.* Vouchers for new plants or new county records, addressed to the Curator, will be placed in the collection.

BEACH MATERIAL AND COAST EROSION.

At a recent meeting of the Bridlington Rural District Council a letter was read from the Mercantile Marine Department of the Board of Trade in reply to an application of the Council for a Crown regulating lease of the foreshore between the southern boundary of the Borough of Bridlington and the southern side of the Barmston main drain, and enclosing a letter from the Commissioners of Sewers, Beverley, for the east part of the East Riding of Yorkshire protesting against the proposed removal of material from the foreshore in question. The letter included the following :—‘ I am directed to inform you that the Court of the Commissioners of Sewers does not agree with the removal of beach material on any part of the coast. It is computed that the erosion even at Barmston amounts to about 3 ft. 6 in., which means a width of about 60 yards during the last 50 years. Surely this is serious enough both for the landowner and the nation; but the general public cares nothing for the individual landowner or the nation so long as it can profit by it, and get its own turn served. If the coast cannot be protected the public should at least pay something towards a fund for protection work, or to compensate the owner for the loss of his land. If the material is of such importance and value, why cannot a charge be made with this object? If the theory enunciated in your letter is correct, why are expensive seawalls and extensive groyning in Bridlington Bay necessary? My Commissioners’ opinion is that the debris created by the destruction of land should be left on the beach for the protection of the land so far as it can do so. It is not even now sufficient for that purpose, and should therefore not be diminished.’ The letter was referred for consideration.

BRITISH MOSQUITOES AND THEIR CONTROL.

Under the above heading the British Museum (Natural History), as ‘Economic Series No. 4a,’ has issued a pamphlet by F. W. Edwards and S. P. James (27 pp., 6d.). From this we learn that ‘The twenty-six different kinds of mosquitoes found in Britain are nearly all described and illustrated, both in their larval and adult stages, in “A Handbook of British Mosquitoes,” by W. D. Lang, Sc.D. (British Museum, Natural History, 1920, price £1). The few species which had not been found when that handbook was written are described and illustrated in “A Revision of the Mosquitoes of the Palaearctic Region,” by F. W. Edwards (published in the “Bulletin of Entomological Research,” Vol. XII., 1921, and obtainable from the Imperial Bureau of Entomology, 41, Queen’s Gate, S.W.7, price 5/-). For the purpose of the present pamphlet it has been thought desirable to summarise such of the information contained in the above-mentioned and other works

as may be of special interest to medical officers and others engaged in mosquito control. Since it is only the female mosquito which bites, this sex alone concerns us here, though some of our British species are mainly distinguished by small differences in the males. Most of our commoner forms, however, are quite easily named from the female.'

EVOLUTION.

It is interesting to find that just now there is a tremendous revival in the study of Evolution, and to observe the various ways in which different publishers are placing well-known classics on the market, as well as new material, in a cheap and popular form. It is particularly remarkable that Darwin's 'Origin of Species' can now be obtained at the low price of one shilling (Watts & Co., 203 pp.), a sixth impression, completing 79,000 copies, having recently appeared. Haeckel's 'Evolution of Man' has also been reprinted in a cheap form by the same firm, and that work, with 364 pages, and over 400 illustrations, can now be obtained for 2/6. Messrs. Watts have also published J. McCabe's 'The A.B.C. of Evolution,' containing 106 pages, and sold at 1/6.

EVOLUTION, HEREDITY AND VARIATION.*

Another volume just to hand is entitled 'Evolution, Heredity and Variation,' by D. W. Cutler, Chief Protozoologist to the Rothamsted Experimental Station, Harpenden. The author's object is to present the results of modern research in as simple a manner as possible. He states 'Now that the teaching of biology is becoming more and more common in secondary schools, it is hoped that this book will be useful to members of the higher forms who are being taught the elementary anatomy and physiology of plants and animals. But I should like to feel that it was regarded less as a school book proper than as a short introduction to the study of the great problems which lie at the base, not only of biology, but also of sociology.'

EVOLUTION IN THE LIGHT OF MODERN KNOWLEDGE.†

Messrs. Blackie & Sons have published an admirable and well-illustrated volume on rather new lines. Headed as above, it contains a number of contributions by the leaders of thought in different directions, and forms a valuable collection of essays on this important subject, from numerous points of view. The articles and contributors are: 'Cosmogony,' by J. H. Jeans; 'Evolution of the Earth as a Planet,' by H. Jeffreys; 'Geology,' by W. W. Watts; 'Biology,' by C. L. Morgan; 'Botany,' by F. O. Bower; 'Zoology,' by E. W.

* London: Messrs. Christophers, 147 pp., 3/-

† London: Blackie & Sons. xv. + 528 pp., 21/- net.

MacBride; 'Physiology,' by M. S. Pembrey; 'Anthropology,' by G. E. Smith; 'Mental Evolution,' by W. M'Dougall; 'Physics and Chemistry,' by F. Soddy; 'Time and Space,' by A. A. Robb; 'Philosophy,' by A. E. Taylor; and 'The Religious Effect of the Idea of Evolution,' by J. M. Wilson.

A LIST OF BRITISH APHIDES.*

Also from the Rothamsted Experimental Station, Harpenden, has been issued a 'List of British Aphides, including Notes on their Synonymy, their Recorded Distribution and Food Plants in Britain, and a Food-plant Index.' Since Buckton's 'British Aphides,' issued between 1876-83, a considerable number of species has been added to the list, and, as seems inevitable, the nomenclature of these insects has undergone revolutionary changes. The author brings together all the known British species of the super-family 'Aphidoidea,' together with their important synonyms, their distribution and food plants as recorded in Britain. The book is divided into four sections, namely, Species List; List of Genera; Food-Plant Index; and Bibliography, and will be a general and useful guide to the identification of species collected in the field.

ZITTEL'S 'MAMMALIA.'

The thanks of the scientific world are due to Messrs. Macmillan & Co. for the extraordinary assistance they give in the publication of reprints of many important works, some of which we feel sure can hardly be remunerative, in view of the present heavy cost of printing, and especially of illustrations. One such work possibly is Volume III., 'Mammalia,' of Karl A. von Zittel's 'Text-book of Palæontology,'* which has been revised by Dr. Max Schlosser, and translated under the direction of the late Dr. Charles R. Eastman by Lucy P. Bush and Marguerite L. Engler. Unfortunately Dr. Eastman died in 1918, but Sir Arthur Smith Woodward was asked to revise the incomplete work, and, with the aid of Baron Francis Nopcsa, he has compared the whole of the translation with the original German text, and has made such emendations as seemed necessary. Sir Arthur Smith Woodward, one of the few persons able to do so, has also added details of more recent discoveries, and has extended the bibliographies relating to later literature. The value of the publication to students lies largely in the wealth of illustration, this volume alone containing no fewer than nearly four hundred admirably made sketches. To readers of *The Naturalist* there is no doubt that Sir Arthur's sober and serious judgment with

* By J. Davidson. London: Longmans, Green & Co. xi.+176 pp. 12/6 net.

* London: Macmillan & Co. viii.+316 pp., 25/- net.

regard to relics of Prehistoric Man make that particular chapter of special service to them.

MARINE BIOLOGISTS.

The Journal of the Marine Biological Association of the United Kingdom* is even more valuable than usual, and includes an extraordinary number of papers dealing with Marine Biology. Among them are :—‘ Experimental Legislation with Reference to the Crab and Lobster Fisheries of the East Coast of Britain,’ by A. Meek ; ‘ The Vertical Distribution of Marine Macropkton : An Observation on Diurnal Changes,’ by F. S. Russell ; ‘ The Euphausiidæ in the Neighbourhood of Plymouth,’ by Marie V. Lebour ; ‘ The Eggs and Newly Hatched Larva of *Typton spongicola* O. G. Costa,’ by Marie V. Lebour ; ‘ The Early Stages of *Nephrops norvegicus*, from the Northumberland Plankton, together with a Note on the Post-larval Development of *Homarus vulgaris*,’ by O. M. Jorgansen ; ‘ A New British Sea Anemone,’ by T. A. Stephenson ; ‘ The Anatomy and Relationships of New or Little-known British Actiniaria,’ by E. M. Stephenson ; ‘ Muscle-Tumours in the European Turbot,’ by M. W. Young ; ‘ A New Type of Luminescence in Fishes,’ by C. F. Hickling ; ‘ The Hydrogen Ion Concentration in the Gut of certain Lamellibranchs and Gastropods,’ by C. M. Yonge ; ‘ A Colorimetric Method for Studying the Dissociation of Oxyhæmoglobin suitable for Class Work,’ by C. F. A. Pantin and L. T. Hogben ; and ‘ The Occurrence of *Onchidella celtica* (Cuvier) on the Cornish Coast,’ by F. S. Russell.

NEW MUSEUM FOR NEWCASTLE.

For some time it has been felt that the present Newcastle Museum, in the historic Black Gate of the Castle, has been inadequate. A site for a new museum has now been offered to the Newcastle Society of Antiquaries on derelict land adjoining the Black Gate, and it is estimated that a sum of £5,000 will cover the cost of the building and the transference of the Society’s fine collection of inscribed and sculptured stones. An appeal has been made for the necessary funds.

—:o:—

A German Professor has been appointed Curator of the Irish Antiquities in the National Museum, Dublin.

We regret to learn that Mr. B. H. Mullen, Curator of the Salford Museum and Art Gallery, died suddenly at Bournemouth on October 23rd.

We regret to learn of the death of our old friend and member of the Union, William Norwood Cheesman. An obituary notice will appear in our next issue.

* New Series, Vol. XIII., No. 4. pp. 755-1021, 8/- net.

NOTES ON YORKSHIRE AMMONITES.

DR. L. F. SPATH.

VIII.—MORE LOWER LIASSIC FORMS.

IN the present instalment it is proposed to deal with the remaining Lower Lias ammonites in the Hull Museum collection, sent by Mr. Sheppard. They include, first of all, a series of sixteen, mostly well-preserved, specimens of a new *Arnioceratid* stock, possibly named by Simpson, but unrecognisable from his descriptions.¹ These new forms are very interesting because they cannot well be included either in *Arnioceratoides* or in the late group of *Arnioceras hartmanni*; and *Arnioceras* of the *geometricum* type and *Eparnioceras* are

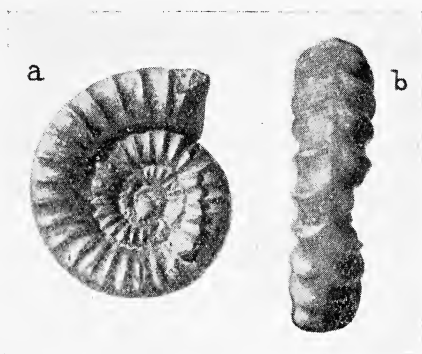


FIG. 11.

(a) *Metarnioceras subpellati* gen. et. sp. nov., side view of holotype;
(b) *Metarnioceras sheppardi* sp. nov., peripheral view of holotype. Both from Holderness Drift, ex Lower Lias. Hull Museum.

altogether different. The suture-lines here figured (text-figs. 12₁ and 2) clearly show, however, that the forms now discussed belong to the *Arnioceratidæ*, in spite of their resemblance to certain *Agassiceratids*. The new name, ***Metarnioceras*** gen. nov., is now proposed for this stock, and as genotype is taken the form here figured (text-fig. 11b) as *Metarnioceras sheppardi* sp. nov., represented by eight examples. It may be briefly defined as latumbilicate, quadrate-whorled, with distant recticostæ, breaking up on the periphery into striate chevrons. These are directed forwards, and form a low

¹ Simpson's names must be considered to be *nomina nuda* as much as Hyatt's unfigured Liassic species recently referred to by Crickmay (*Proc. Calif. Acad. Sci.* (4), Vol. XIV., No. 3, 1925, pp. 77-81).

carina in the median line, accompanied by faint lateral grooves. Suture-line (fig. 12₂) with U₃ undeveloped.

At least three allied forms seem to be represented in the material before me, all more finely costate, either on the inner or on the outer whorls, than *M. sheppardi*, and with differing whorl-sections. Two other new Yorkshire forms in the British Museum (Nos. 33581 and 37807)¹ are transitional to *Arnioceratoides*. On account of the uncertain horizon it appears best not to describe them for the present, but one of

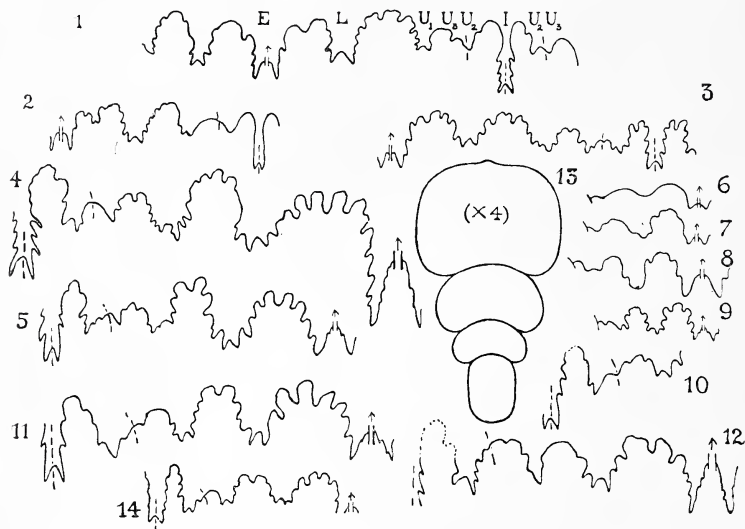


FIG. 12.

(1) *Metarnioceras subpellati* gen. et. sp. nov. Suture-line of holotype (see fig. 11a) in Hull Museum, at diameter of 20 mm. (2) *M. sheppardi* sp. nov. Suture-line of an example in Hull Museum, at 10 mm. (3) *Defossiceras*, sp. juv., B.M., No. C.17033a, Robin Hood's Bay (?), at 15 mm. (4) *Epophioceras* aff. *landrioti* (d'Orbigny), B.M., No. C.16498, Weston Hill, Gloucestershire, at 60 mm. (5) *Parechioceras* aff. *neglectum* (Simpson) S. S. Buckman, B.M., No. 17155 (ex Ripley Colln.), 'Whitby,' at 40 mm. (6-13) *Gagaticeras gagateum* (Young and Bird), Yorkshire. (6-9), suture-line development at 3, 5, 8 and 13 mm. (L.F.S., No. 1997). (10) umbilical and internal lobes of another specimen (B.M., No. C.19193, Blake Colln.). (11, 12) Two other examples (L.F.S., Nos. 1998-9). (13) Outline whorl-section ($\times 4$) of same specimen as 6-9. (14) *Parechioceras*? (*Gagaticeras*?) sp. juv., B.M., No. 19535z, Kilsby Tunnel, Northants, at 10 mm.

them, *M. subpellati* sp. nov. (see fig. 11a), seems to be identical with '*Aegoceras pelli*' Blake non Dumortier (1876, p. 273,

¹ Resembling *Amm. neera* and *A. leda* Reynès (1879, Pl. L., figs. 33-8).

Pl. VI., fig. 5, B.M., No. C.17880). This was recorded from the 'bucklandi zone' of Redcar,¹ and in view of what will be said below as to the resemblance between *Metarnioceras* and *Parechioceras*, it is important to note that Blake already considered his poorly preserved and unsuccessfully drawn Redcar fragment to be nearly allied to *Ammonites pauli*, Dumortier.²

Arnioceras kridioides Hyatt,³ already listed from Yorkshire by Messrs. Thompson and Buckman, has the closest resemblance in lateral ribbing to *Metarnioceras sheppardi*. It is probable, however, from the inclusion, by Hyatt, in its synonymy, of Quenstedt's *Ammonites kridion*,⁴ formerly compared by the writer⁵ to *Arnioceratoides* (?) *pseudokridion* (Spath)⁶ and of Quenstedt's *Ammonites bucklandi carinaries*,⁷ that Hyatt's species is an *Arnioceratoides*, more distinctly keeled than the new stock here dealt with. Hyatt's *A. tardecrescens*⁸ also, though similar in side-view, is more strongly keeled; and if the reference to Hauer's *Ammonites tardecrescens* is at all near the mark it must belong to quite another stock.

Now *Metarnioceras* is of special interest on account of its resemblance to *Parechioceras*. Mr. Buckman labelled one of the examples (*Metarnioceras* sp. nov. I.)—probably the 'Cf. *Echioceras neglectum*? Simpson sp. of Mr. Thompson's list, p. 180—as follows:—'This is new to me. It may be allied to *A. neglectus* Simpson, and it looks something near to *A. defossus*, Bean, in Simpson, of which the affinities and consequently genus are very doubtful.' Since then, Mr. Buckman has created for Bean's MS. species, the genus *Defossiceras*, giving as its level the 'capricornus zone,' but the writer has pointed out on a previous occasion⁹ that this form has a type of suture-line that should not be found at the horizon stated, and that it would probably turn out to be an Arietid (*Agassiceras*) of 'semicostatum' age. Also *Amm. neglectus* was subsequently¹⁰ referred to the genus *Parechioceras*, as genotype of which was taken *P. finitimum* (Bean MS.) Blake sp.,¹¹ and which included *Amm. pauli* Dumortier, already mentioned. The suture-line of a *Parechioceras* close to *P. neglectum* is here figured (fig. 12₅), also that of an immature

¹ See Crick., *loc. cit.*, (1922), p. 275.

² *Loc. cit.* (ii., 1867), p. 161, Pl. XXIX., figs. 5-6.

³ *Loc. cit.* (1888), p. 171, Pl. ii., fig. 28.

⁴ *Loc. cit.* (1883), Pl. XI., fig. 5.

⁵ *Loc. cit.* (1923), p. 71.

⁶ *Loc. cit.* (1924), p. 187.

⁷ *Loc. cit.* (1883), Pl. XI., fig. 3.

⁸ *Loc. cit.* (1888), Pl. II., fig. 19.

⁹ Spath, *loc. cit.* (1919), p. 170.

¹⁰ 'Yorkshire Type Ammonites,' Vol. II. (1914), Pl. 101.

¹¹ *Loc. cit.* (1876), p. 273, Pl. VI., fig. 9.

doubtful example ('*Amm. planicosta*') of either this genus or of *Gagaticeras*, from Kilsby Tunnel, Northamptonshire (fig. 12₁₄), and it is interesting to note that they are quite different from the suture-lines of *Metarnioceras*. Similarly they show that Hauer's *Ammonites raricostatus*¹ and Schafhäütl's *Amm. charpentieri*,² which were included by Mr. Buckman in *Parechioceras*, have no affinity with this genus, but are true Echioceratids.

Now even if *Defossiceras* is an Agassiceratid, as the suture-line (fig. 12₃) appears to demonstrate, and not an Amaltheid of much later date, as Mr. Buckman holds, its resemblance to *Parechioceras* is as accidental as the likeness to *Metarnioceras*. Mr. Buckman, whilst including *Parechioceras* in the family Echioceratidæ, stated that the *Gagaticeras*-like inner whorls and suture-line indicated 'origin different from *Echioceras*.' Dr. Trueman and Miss Williams, in their recent 'Studies in the Ammonites of the family Echioceratidæ,'³ merely restate this view, so that it seems desirable to trace the probable affinities of *Parechioceras* and its presumed close ally *Gagaticeras*. At the same time we may examine why Continental authors⁴ still persist in connecting *Echioceras* (= *Ophioceras*) with Arietidæ, as had been done by Hyatt⁵ and Wright.⁶ Such entirely new stocks as **Tmaegophioceras** gen. nov. (proposed for *Arietites lævis*, Stur MS., Geyer, *loc. cit.* Hierlatz, 1886, p. 252, Pl. III., figs. 10a-c) and **Protechioceras** gen. nov. (for *Vermiceras formosum* Fucini, *loc. cit.*, Cetona 1902, p. 158, Pl. XVI., figs. 13a-c) indicate that there were remarkably rich faunas existing in the Upper Sinemurian in Mediterranean areas. The time gap between the existence of late Arietids (*Epophioceras*, *Ægasteroceras*, and *Eparnioceras*, discussed in the present notes) on the one hand, and the Echioceratids on the other, in north-western Europe, is considerable, and includes the Oxynoticeratan age; but the far more prolific Mediterranean deposits are as yet very inadequately explored, and the Schlotheimid succession is equally discontinuous. There is also a temptation to be dogmatic about the principle of dissimilar faunas, as old as William Smith, but only since Mr. Buckman's work on the Inferior Oolite Ammonites applied in greater detail. Although

¹ *Loc. cit.* (1856), Pl. XVI., figs. 10-12.

² 'Geognost. Beobacht.' (1851), Pl. XVI., fig. 22, Südbayern's Lethæa Geognost. (1863), p. 407, Pl. LXXX., figs. 1a-c.

³ *Trans. Roy. Soc. Edinb.*, Vol. LIII., Pt. 3 (1925).

⁴ Compare e.g., Zittel's 'Grundzüge der Paläontologie,' 5th German ed. (1921), p. 556; Dietz, *loc. cit.* (1923), p. 490.

⁵ *Loc. cit.* (1888), p. 59, etc.

⁶ *Loc. cit.* (1880), p. 249 (1881), p. 298.

this has proved successful so far with local faunas, no wider correlations with, for example, Mediterranean assemblages, have yet been attempted.

The enquiry may also be extended to embrace the possible connections—already hinted at on p. 306—between the interesting Yorkshire genera and *Promicroceras*, *Bifericeras* and other Deroceratida.¹ It is necessary in the first place to give suture-lines of the stocks here discussed. Few of these have

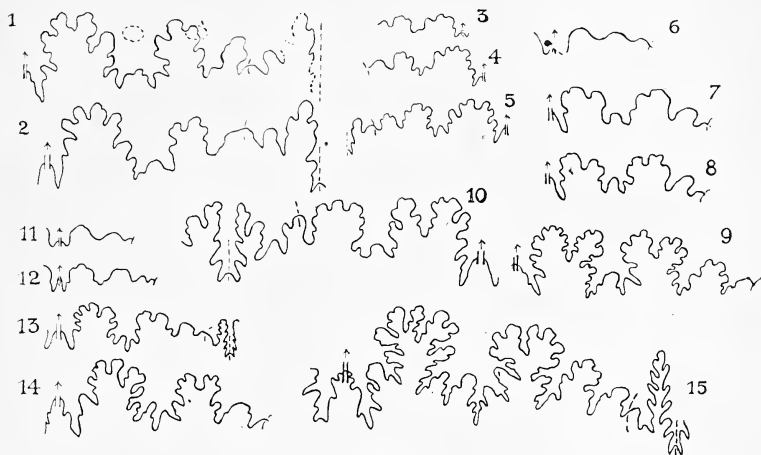


FIG. 13.

(1) *Bifericeras bifer* (Quenstedt), Göppingen, Württemberg; L.F.S., No. 1996; suture-line at 12 mm. (2) *Bifericeras* sp. aff. *nudicosta* (Quenstedt), Gloucestershire, L.F.S., No. 1995, at 12 mm. (3-5) *Microceras* sp. juv., Gloucestershire, L.F.S., No. 1993. Immature suture-lines at 4, 6 and 11 mm. (6-9) *Microceras* (*Crucilobicer*?) sp. juv., Gloucestershire, L.F.S., No. 1992. External suture-lines at 3, 6, 10 and 25 mm. (10) *Microceras subplanicosta* (Oppel) Gloucestershire, L.F.S., No. 1994; at 20 mm. (11-15) *Deroceras* sp. juv. Locality unknown, L.F.S., No. 1991; suture-lines at 2 mm. (third whorl), 5, 9, 15 and 25 mm.

been published hitherto, and those incomplete, and not giving the internal half, on the ramifications of which Prof. Salfeld and his school are laying probably too great a stress. The

¹ Including **Eoderoceras** gen. nov. (genotype :—*Deroceras bispinigerum*, S. Buckman, *Quart. Journ. Geol. Soc.*, Vol. LXXIII., 1918, p. 302), with several new species to be described separately; and **Meta-deroceras** (genotype :—*Ammonites muticus*, d'Orbigny, 'Pal. Franç., Terr. Jurass.', 1844, Pl. LXXX., p. 274), previously (p. 171) referred to *Crucilobicer*. Pia's *Deroceras tardecrescens* is morphologically transitional between *Metaderoceras* and *Epideroceras*.

complete lobe-lines of various Echioceratids, *Deroceras* and *Microceras* are also added for comparison.

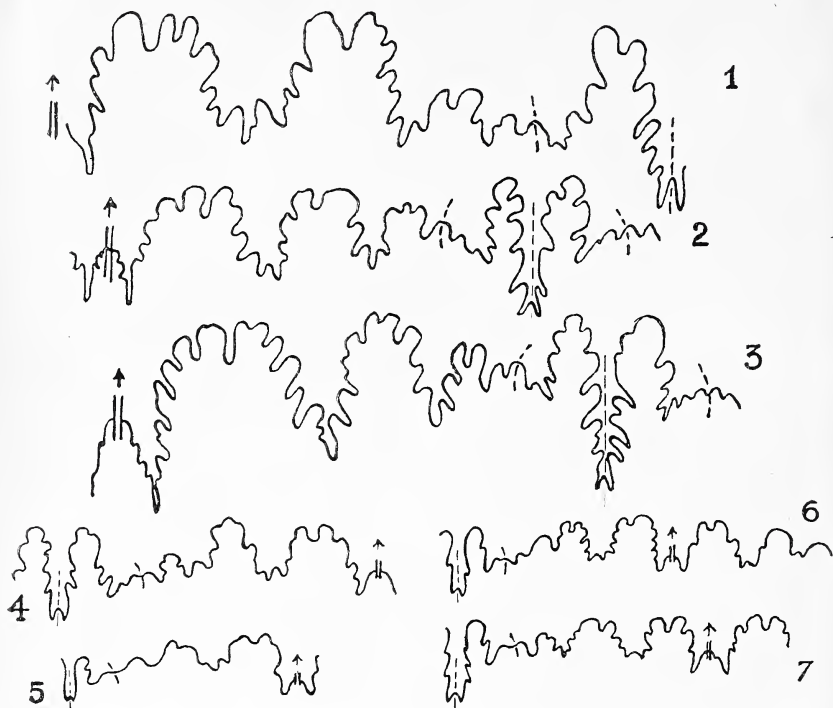


FIG 14.

(1) *Echioceras* aff. *varicostatoides* Vadasz. Radstock district, at 45 mm. (L.F.S., No. 1990). (2) *Echioceras* aff. *aeneum* Trueman and Williams, Lyme Regis, at 35 mm. (L.F.S., No. 1989). (3) *Echioceras* sp. aff. *aeneum* T. and W. (B.M., No. C.18745), Lyme Regis, at 50 mm. (4) *Echioceras* sp. juv., Worcestershire, L.F.S., No. 1987, at 16 mm. (5) and (7) *Echioceras* sp. juv., Lyme Regis, L.F.S., No. 1988, at 10 and 30 mm. (6) *Echioceras aureolum* (Simpson) S. S. Buckman, Drift, ex Lower Lias, Yorkshire, Hull Museum, at 19 mm.

(To be continued.)

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Notes on Sussex Ornithology. Being Extracts from the Diaries (1845-1869) of Robert Nathaniel Dennis (Sometime Rector of East Blatchington). Selected and Edited by W. H. Mullens, M.A., LL.M., F.L.S., and N. F. Ticehurst, O.B.E., M.A., F.R.C.S. (Eng.) (Member of the British Ornithologists' Union). London: H. F. & G. Witherby, 326 High Holborn, W.C., 1925. 110 pp., price 5/-. We have, we think, now devoted all the space we can spare to this pamphlet, though we think that if it were worth publishing at all it should be worthy of more than a paper cover.

COAST EROSION AT ALDBROUGH, E. YORKS.

T. PETCH, B.A., B.SC.

IN *The Naturalist* for February, 1921, p. 76, a table was given, showing the distances of four points from the cliff edge at Aldbrough at four dates from 1893 to 1920. These distances were measured again in October, 1925, and the table, brought up to date, now reads as follows, the distances being given in feet :—

Station.	August, 1893.	January, 1901.	August, 1911.	Sept., 1920.	October, 1925.
A	189	151	103.5	84	80
B	146	118	112	88	84
C	157	123	90	75	71
D	—	270	210	177	120

In the table as printed in 1921, there was unfortunately an error in the distance at point C, this being given as 22 yards instead of 25 yards.

Station A is at the lowest point of the cliff top at Aldbrough, the dip known as 'Old Dales.' Measurements were taken from the south post of the gate through which the old road to the cliff formerly passed, along the line of the road to the cliff edge. That gatestead has now been blocked up and a stile substituted for the gate, the former south gate post remaining in its old position, as the north post of the stile. The average loss at this point for the last 32 years has been 3.4 ft. per annum. Mr. Thompson's measurement at this point in 1922 is 84 ft., the same as my measurement in 1920, but it is, of course, improbable that it refers exactly to the same line. It is possible at the present day to obtain a greater measurement by taking a line a few feet to the south of that to which these records refer.

Station B is in the field immediately north of 'Old Dales.' The ground rises sharply from the dip to the northern end of this field, and the measurements were taken at the higher end. There was formerly a gate in the hedge which runs parallel to the cliff, and the measurements were taken from the northern gate-post to the cliff edge. The gate-post has now disappeared, but its former position is sufficiently accurately known for the purpose of these measurements. The average loss at this point for the last 32 years has been 1.9 ft. per annum. One reason for the difference between the average loss at A and B is that there was a big slip at B just before these records were begun. The greater loss at A is not to be attributed to the action of land water, as the drainage of the hinterland at this

point is westwards, *via* the Lambwath stream to the river Hull.

Station C is the inn on the cliff top at Aldbrough, measurements being taken from the south-east corner of the main buildings (ignoring the adjacent lower out-buildings) eastwards to the cliff edge. The average loss here for the last 32 years has been 2.7 ft. per annum. Mr. Thompson measured from the south-west corner of the same building. As the side of the house measures 24 ft., his measurement, 95 ft., in 1922, agrees with mine, 71 ft., in 1925. In 1920, it was just possible to walk along the cliff top, past the eastern end of the tea house; at the present time, that end of the tea house is level with the cliff edge or projects slightly beyond it.

Measurements at Station D are taken from the south-east corner of the house which stands immediately to the west of the cart road leading to 'Black House.' That building has been known at various times as 'Red House,' 'Cliff House,' and 'Miss Harbord's.' Measurements were first taken at this point in 1901. The average loss at this point during the last 24 years has been 6 ft. per annum. But of the 150 feet counted as lost at this point, a piece, 53 ft. wide, has only recently begun to slip, and is now (October, 1925) only six inches or so below its original level.

The loss of land at the first three points during the last five years has been slight, only 4 ft. at each; and, had the last measurements been taken a few months earlier, the loss at D would have been the same. But the loss at D has just been increased by 53 feet by one slip.

It is often overlooked that the loss of land on the Holderness coast is not a uniform process. In general, the cliff slips in a large piece, and no further appreciable loss occurs at that point for several years. The full sequence of events does not appear to have been observed. A slip is first indicated by the appearance of long cracks in the land above, running in arcs from the cliff edge and cutting off a segment which may be ten or fifteen yards wide at its broadest part and fifty yards or more long. This is ultimately followed by the subsidence of the area bounded by the cracks. If the section split off is narrow, it may fall over on to the beach; but if it is broad it slips down, and for some years forms a 'half cliff.' But we have no record of what happens at the base of the cliff or on the cliff face prior to the appearance of cracks on the land above. The actual slip is evidently a restoration of a position of equilibrium in the cliff mass.

Alarming reports have recently been published concerning the loss of land now occurring or about to occur at Aldbrough. This loss, no doubt, appears alarming to anyone who is not familiar with the Holderness coast, but nothing is now

occurring at Aldbrough beyond what has happened periodically for ages past, only there are now more people there to notice it. During the last two or three years a row of 'bungalows,' or 'beach huts,' has been built along the cliff top, and naturally the inhabitants of these are seriously concerned over the changes in the cliff. It has already been stated that a large slip is just occurring at station D. Cracks have also appeared, running nearly to the fences of the bungalows, at another point between D and the inn, and similar cracks at a point further south, between the inn and station B. Thus two more large slips are imminent, and will probably occur during this winter. But a reference to the table will show that there has been very little loss of land along this strip during the last five years, and no large slip for at least fourteen years. Though it is no consolation to the owners of the habitations in question, they have built them near the cliff edge at a time when big slips are due.

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Plant Disease Fungi, by **F. L. Stevens**. New York : The Macmillan Co., x.+469 pp. 21/- net. The Professor of Plant Pathology in the University of Illinois has brought together a valuable series of chapters dealing with Plant Disease Fungi, illumined with a wealth of illustration with which we are familiar in works published by the House of Macmillan. There are over four hundred photographs, micro-photographs and sections of various species of Fungi, illustrating the way they affect plants, large and small. The aim of this book is to present the more important facts concerning the morphology and taxonomy of the fungus parasites that affect plants of importance in the United States, with some discussion, also, of the more significant facts of morbid histology. Technical descriptions of each division, order, family, genus, and species, when important, are given.

The Geology of the Country Around Birmingham, by **T. Eastwood**, **H. Whitehead** and **T. Robertson**. With contributions by **T. C. Cantrill**. London : H.M. Stationery Office. 152 pp., 4/- net. This volume deals with a part of England which is particularly fascinating to the geologist, and in this official publication the authors have not failed to make an interesting story. According to the notes conveniently supplied by H.M. Stationery Office, 'This memoir describes the geology of 216 square miles of country around Birmingham represented on the colour-printed geological map (Sheet 168). The solid formations include members of the Cambrian, Silurian, Carboniferous, Triassic, and Jurassic systems ; the superficial deposits consist of Glacial drift and river deposits. Intrusive igneous rocks are represented by the dolerite of the Rowley Hills. All the outcrops (especially the Coal Measures of the south-eastern part of the South Staffordshire Coalfield) are described in detail, and particulars are given of the range of the Pre-Carboniferous rocks beneath the Coal Measures. Folds and faults are traced, and the chapter on economics contains details of over a hundred wells and borings. The volume closes with a short bibliography, a list of Geological Survey photographs, and a copious index.' The two maps, solid and drift, published simultaneously with the Memoir, are fine examples of colour printing, and contain a wonderful amount of additional information in the sections and details given on the margins. Each map is issued at two shillings.

FIELD NOTES.

GEOLOGY.

Elephant Tooth at Bridlington.—Mr. J. A. Carlill, of Hull, has shown me a small tooth, apparently of *Elephas antiquus*, recently found on the beach south of Sewerby, Bridlington, and from its condition and state of preservation, it has clearly been washed from the buried cliff. The tooth is evidently of a young animal, and measures 4 ins. by 4 ins., and $2\frac{1}{2}$ ins. in width. It weighs $1\frac{3}{4}$ lbs.—T. SHEPPARD.

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BOTANY.

Entomophthora muscivora Schroet. This fungus was found at Aldbrough, E. Yorks., in October, 1925, on a large fly attached to the body of a dead stoat suspended in a vermin gibbet. It does not appear to have been recorded previously for Great Britain.—T. PETCH.

Yorkshire Bryologists at Buckden.—An enjoyable week-end was spent at the 'Buck' Inn, Buckden, on September 19th-20th. The party was only small, but the woods and adjacent moors were fairly well explored. Among a large number of common mosses and hepatics, the following are the most interesting :—**MOSES** : *Orthothecium rufescens*, *Andreæa petrophila*, *Bartramia Oederi*, *Orthotrichum cupulatum*, *Eurynchium crassinervium*, *Plagiothecium silvaticum*, *Hylocomium brevirostre*. **HEPATICS** : *Plagiochila asplenioides* (C. Per.) ; *Scapania aspera*, *S. gracilis*, *Madotheca rivularis*.—F. E. MILSOM.

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BIRDS.

Black Redstart in Yorkshire.—I saw a Black Redstart, (male) on Nov. 6th, 1925, on Moor near Breckon Howe, half way between Sleights and Goathland, at about 900 ft. above sea-level. The chestnut tail, which was shaken in Redstart fashion, black throat, and largish white wing-spots were all conspicuous. I heard of another Black Redstart (female) seen by Rev. M. A. Horsfall, at Whitby Abbey, on Nov. 18th.—W. S. MEDLICOTT.

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ENTOMOLOGY.

An Algerian Beetle alive in Hull.—On October 21st I received from Mr. Sheppard a living specimen of a Tenebrionid beetle which had been among rubbish in a building belonging to the Humber Fishing and Fish Manure Company. It appeared to be a species of *Akis*, and Mr. Blair, of the British Museum (Natural History) has kindly identified it as *A. goryi* Sol., from Algeria. On further enquiries being made, it appears to have occurred near bags which had been received from a firm which imports a raw phosphate from Algeria.

The genus *Akis* Herbst, contains about 25 species, and is allied to our British *Blaps* or 'Cellar Beetle.' It occurs mainly in the Mediterranean region, and is found on the ground, under stones, etc., and shuns the light. The dull black colour of the insect accords well with its nocturnal habits.—WM. J. FORDHAM, M.R.C.S., F.E.S.

Platycis minuta F., etc., at Sandsend.—I was fortunate in taking a couple of specimens of this rather rare species in Mulgrave Woods during August last. They were resting on the ground near to each other, and not far from an old tree stump, from which they might have emerged. Mr. Fordham tells me that the previous Yorkshire records are from Scarborough (R. Lawson) and Forge Valley (W. C. Hey), neither very recent. *Lebia chlorocephala* Hoff., a species more widely distributed in the county, occurred under a plank near the entrance to the same grounds. *Hister 12-striatus* Sch., new to V.C. 65, was obtained on the Yorkshire side of the river near Middleton-in-Teesdale in June. I have to thank Messrs. Fordham and E. G. Bayford for supplying information respecting these beetles.—JAMES M. BROWN, Sheffield.

Yorkshire Orthoptera.—My friend, Mr. W. J. Lucas, has recently had an opportunity of examining the 'Dale' Collection of British Orthoptera in the Hope Department of the University Museum, Oxford, and in the current number of the *Entomologist's Monthly Magazine* (November, 1925), gives notes from the labels, etc., on all of them. It is interesting to find among them three species which are new to the Yorkshire List as we knew it until now, although all of them were taken so long ago as 1837! They are *Stenobothrus elegans* Charp., 'Thorne, August 17th, 1837'; *Gomphocerus maculatus* Thunb., 'Thorne, July 25th, 1837, and August 11th, 1837'; *Tetrix subulatus* Linn., 'Thorne, July, 1837.' All of them are species which might be expected to occur in the county. Besides them *Platycleis brachypterus* Linn., 'Thorne Moor, August 11th, 1837,' occurs in the list, but it has long been known as plentiful there and elsewhere in the county. *Stenobothrus rufipes* Zett., 'Wyke, August, 1857,' and *Stenobothrus parallellus* Zett. are also noted, which may refer to the Wyke in Yorkshire, but this is not indicated. Both have more recently been recorded for the county.—GEO. T. PORRITT, Elm Lea, Dalton, Huddersfield, Nov. 7th, 1925.

Two new Yorkshire Beetles.—On July 11th, I was beating a wind-felled pine on Cloughton Bank when two *Ernobii* fell on the beating tray. One immediately took to flight in the hot brilliant sunshine, but I secured the other, and so was able to confirm my first determination of it as *Ernobius nigrinus* Sturm. This is the first Yorkshire record, and, I believe, the first English record also. This adds one

more to the lengthening list of ' Scotch ' beetles which, of late years, have been taken in more Southern localities, e.g., *Acrulia inflata* Gyll., *Quedius* (*Quedionuchus*) *lævigatus* Gyll., *Phyllodrepoidea crenatum* Grav., etc. Some of these are doubtless only rare species, recorded from new localities in a discontinuous distribution, while others owe their spread to the extensive planting of conifers due to afforestation schemes, and others conceivably are species which are gradually and naturally extending their range southwards. In August Mr. T. Stainforth told me that he was taking an *Æpus* at Robin Hood's Bay. A visit on September 7th produced three specimens after six hours' search, and these proved to be *A. robinii* Lab. This is an insect of ' Lusitanian ' origin, and, as it has been recorded from Northumberland and Durham and from the Forth area, its occurrence in Yorkshire was only to be expected.—GEO. B. WALSH, Scarborough.

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MOLLUSCA.

On some varieties of *Cepaea nemoralis* (Müller) and *C. hortensis* (Müller) from Faxø, in Denmark.—In the Faxø limestone quarry in South-east Zealand, *Cepaea nemoralis* Müll. and *C. hortensis* Müll. are numerous, and when visiting the place on June 1st, 1925, I collected a great number of specimens. Of *C. nemoralis* Müller, the band variations are numerous, sixteen different formulæ being noted; all the shells were bleached white, especially on the upper surface, the result probably of prolonged exposure in some exposed situation. Many specimens were high spired and belong the var. *acuminata* Baudon (= *conoidea* Clessin). Further, I noticed a single var. *roseolabiata* Kobelt and several specimens which exceeded 20 millimetres in diameter, approaching the var. *major* Férussac. The var. *minor* of Moquin-Tandon, 13 millimetres in diameter, was also found. Of *C. hortensis*, there are several specimens of the var. *fuscolabris* of Kreglinger and a single specimen of var. *griseobrunnea* Esmark. All the specimens of *C. nemoralis* were very thick shelled, and several approached the var. *ponderosa* Malm (= var. *creticola* Mörch), the heaviest weighing nearly 30 grains; very characteristic specimens of this variety average 44 grains and extraordinary ones may weigh as much as 80 grains, though the normal *C. nemoralis* averages only 11 or 12 grains. All the specimens are in the Schlesch Collection, Hull Museum.—HANS SCHLESCH.

—: o :—

A local paper states that ' attracted by a fight between a cat and a stoat for possession of a rabbit on the roadside, a cyclist killed the stoat, drove off the cat, and appropriated the rabbit. To this *Punch* adds, ' It is rumoured that the cyclist is a lawyer.'

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COMPILED BY W. E. L. WATTAM.

It is not an index in the strictest sense of that term, but it is a classified summary of the contents of the volume, arranged so as to be of assistance to active scientific investigators; the actual titles of papers not always being regarded so much as the essential nature of their contents.

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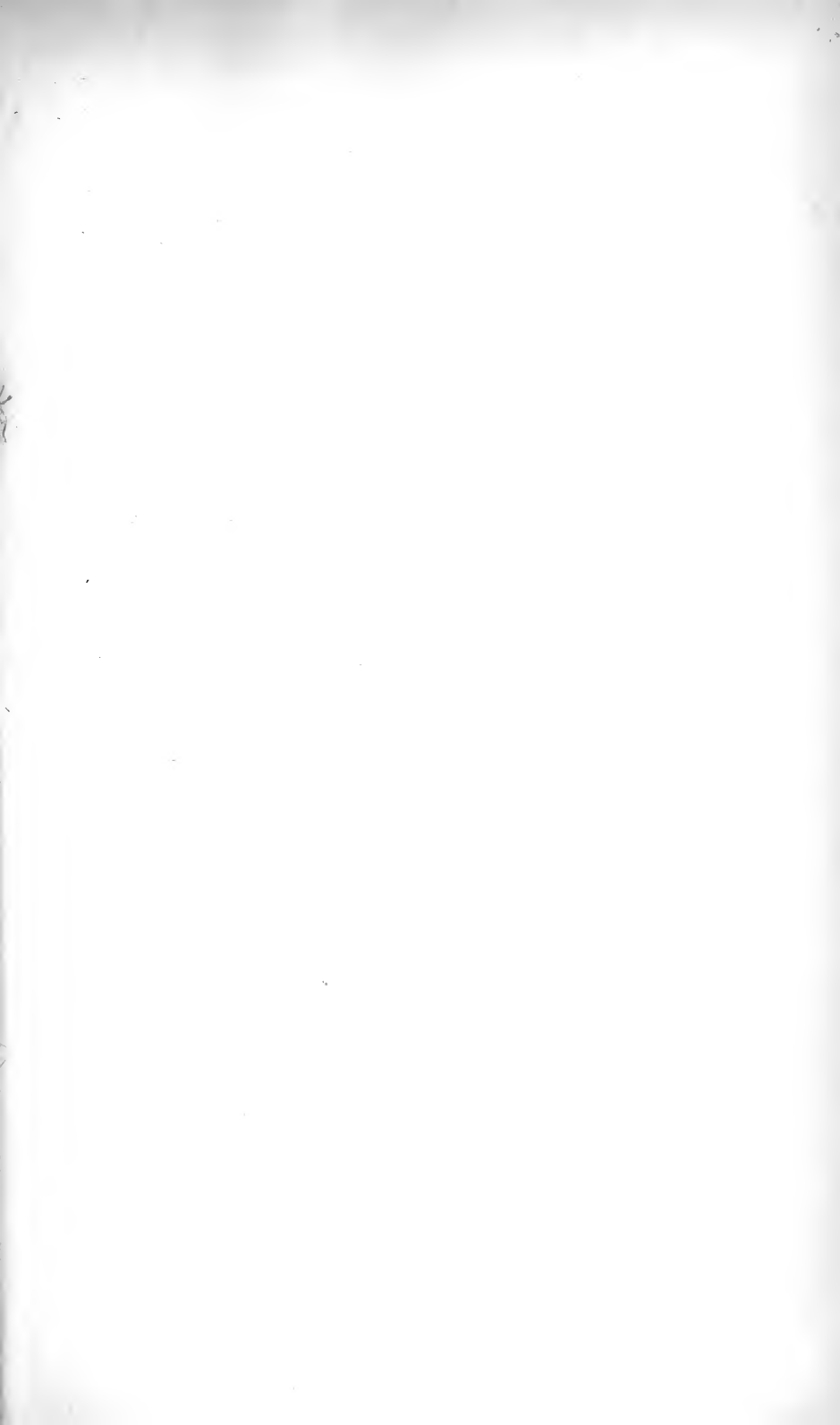
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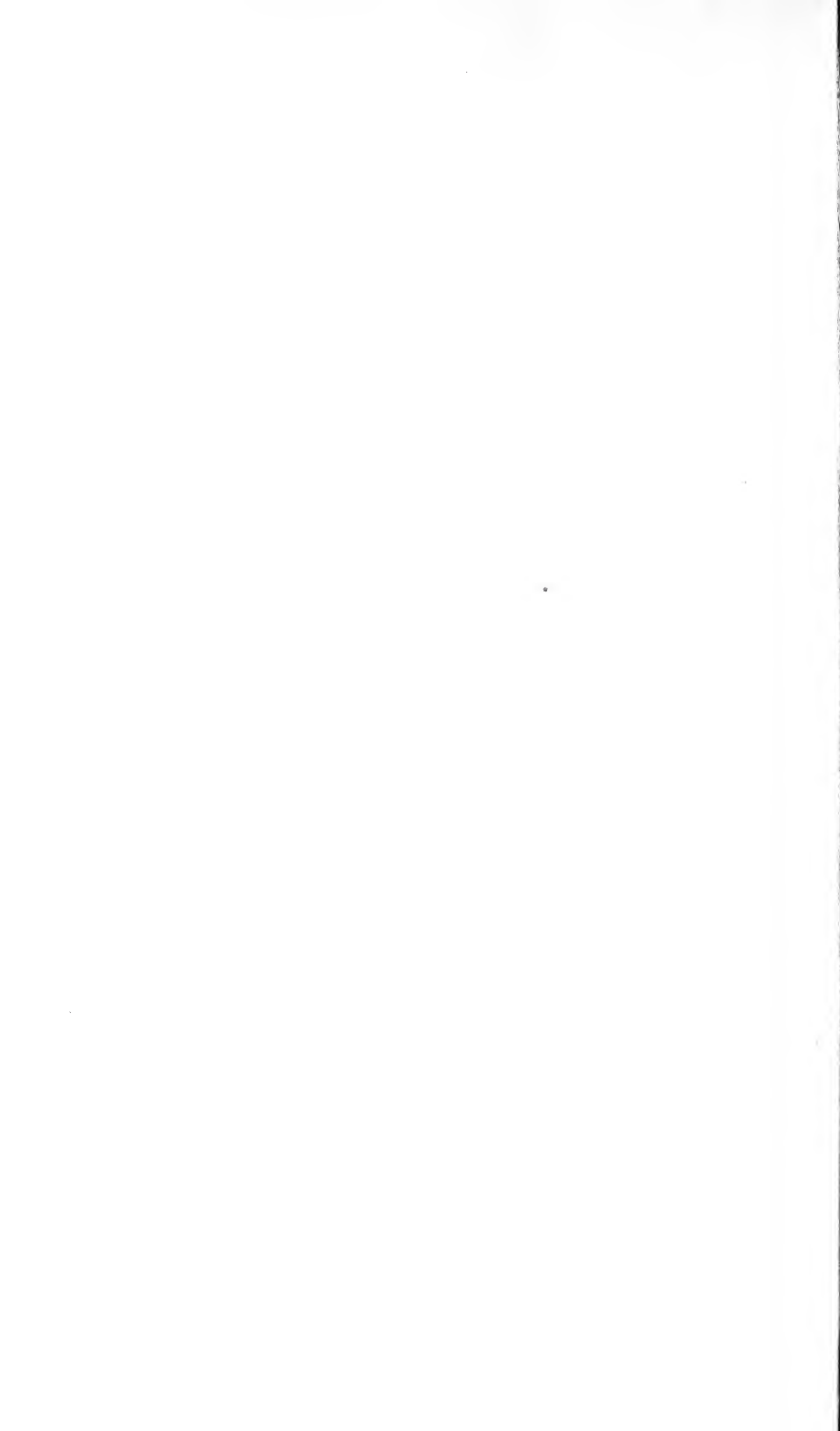
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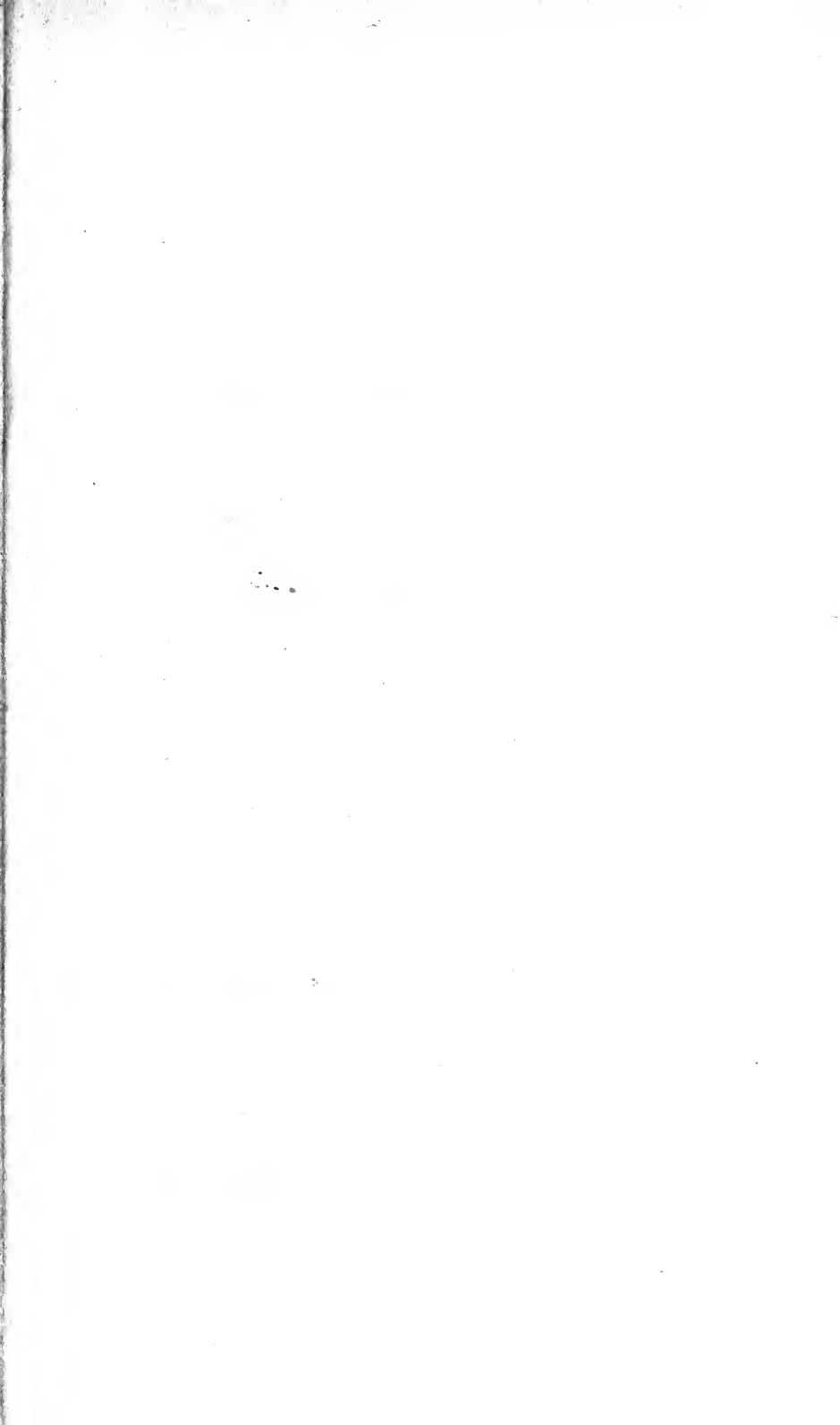
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